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THE INSECT PEST SURVEY
BULLETIN

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Volume 17

1937

BUREAU OF
ENTOMOLOGY AND PLANT QUARANTINE
UNITED STATES
DEPARTMENT OF AGRICULTURE
AND
THE STATE ENTOMOLOGICAL
AGENCIES COOPERATING

THE INSECT PEST SURVEY
BULLETIN

Volume 17

March 1, 1937

Number 1

BUREAU OF
ENTOMOLOGY AND PLANT QUARANTINE
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AGENCIES COOPERATING

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INSECT PEST SURVEY BULLETIN

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THE MORE IMPORTANT RECORDS FOR JANUARY AND FEBRUARY

The unseasonably warm weather of January and February in the Southeastern States stimulated insect activity. The outstanding development was the outbreak of the green bug, which centered in Georgia and occurred also in South Carolina and Alabama; however, the effect of the sudden cold weather of the last of February was being felt in some locations and may check the outbreak.

Such insects as the cabbage butterflies and noctuid moths were observed in flight. The development of the Monarch butterfly from egg to pupa was reported from Florida January 16.

Counts of samples of hibernating chinch bugs in Tippecanoe County, Ind., showed that 57 percent of the bugs were living on February 1. A high percentage of the chinch bugs in Illinois were alive the middle of January.

Reports from New Hampshire, Pennsylvania, and Virginia, indicate that eggs of fruit aphids are scarce.

Eggs of the eastern tent caterpillar were reported as hatching the third week in February in the extreme southern part of the Hudson Valley in New York.

The San Jose scale is passing the winter successfully in central and southern Illinois, from 24 to 60 percent of the scale being alive. In Idaho, however, 100 percent mortality occurred above the snowline, where counts have been made.

The plum curculio is keeping pace with the early blooming of peach trees at Fort Valley. An adult was jarred from the trees on February 8, the earliest record of such occurrence.

Reports from California show no marked effect of the unusual cold weather on scale insects on citrus.

The vegetable weevil is occurring in abundance from Charleston, S. C., in the East, around the Gulf States to Harrison County, Tex., in the West.

The diamondback moth was reported as unusually abundant on cabbage in scattered localities in the Gulf States and on broccoli and cabbage in Texas.

A new infestation of the sweetpotato leaf beetle was discovered in Mobile County, Ala., in December. Although the insect has been reported from central and northern Alabama, this is the first record in the southern part of the State.

The fall cankerworm was reported to be mating on December 13 on Long Island. The moths have also been active in that general section of the country all winter.

Larvae of Parharmonia pini Kellicot were collected on pine in the mountainous section of northern Georgia. They were determined by C. Heinrich, who says: "This is our first record from the far South." G. M. Bentley reported the species from Cumberland County, in eastern Tennessee, on July 16, 1936.

GENERAL FEEDERS

GRASSHOPPERS (Acrididae)

New Hampshire. L. C. Glover (February 25): A report from Portsmouth, Rockingham County, in the southeastern part of the State, says that grasshoppers were hopping about during the third week in February. They were probably of the genus Chorthophaga.

Indiana. J. J. Davis (February 23): There is every indication that grasshoppers will be abundant in northern and western Indiana and that scattered outbreaks will occur in other parts of the State.

Illinois. W. P. Flint (February 22): In connection with some of our laboratory work at Urbana this winter, we have been bringing in numbers of grasshopper eggs about every 7 to 10 days. Approximately 80 percent of these eggs have been hatching. They are apparently coming through the winter in very good condition.

Idaho. C. Wakeland (February 24): Grasshoppers are at a low point in their population cycle in Idaho. From the 1936 survey of adults, outbreaks are not expected in 1937, but in a few localities the populations will be heavier than in 1936 and will be above normal.

MORMON CRICKET (Anabrus simplex Hald.)

Idaho. C. Wakeland (February 24): A State-wide egg survey made in the fall of 1936 indicates that approximately 1,326,000 acres of crop and range lands are within the borders of the infested areas in 21 counties and that a minimum of 90,000 acres of land will need to be dusted to obtain commercial control in 1937. While the infested area is probably no greater than it was in 1936, the density of the population is expected to be much greater, especially in counties in the western part of the State.

SAY'S STINKBUG (Chlorochroa sayi Stal)

California. C. S. Morley (February 4): We are finding many of the Say's plant bugs hibernating under clumps of Russian-thistle in Kern County. This species caused much damage 2 years ago.

ARMYWORM (Cirphis unipuncta Haw.)

Georgia. T. L. Bissell (February 3): Armyworms (C. unipuncta) were found in hibernation under plant debris on February 3, but are not more numerous than they were a year ago.

BELLA MOTH (Utetheisa bella Comst.)

Florida. J. R. Watson (February 24): Full-grown larvae of the bella moth have been seen in the Gainesville district.

CUTWORMS (Noctuidae)

Florida. J. R. Watson (February 24): Such insects as cutworms have been unusually common.

MONARCH BUTTERFLY (Danaus meniope Hbn.)

Florida. H. T. Fernald (January 16): Found eggs and larvae up to 1 inch long, feeding freely and saw four chrysalids just completed, from the plants, removed just before pupation. This is, I think, the first record of its breeding at Orlando at this time of year, by actual finding of the early stages, though I have reported taking fresh adults the last of March and first of April.

BUTTERFLIES (Lepidoptera)

Georgia. T. L. Bissell (January 23): Butterflies, species of Pieris and Colias, were in flight on January 23. A specimen, probably Catopsila eubule L., was caught on December 18.

P. M. Gilmer (January 16): Cabbage butterflies are rather common at Tifton.

Tennessee. G. M. Bentley (February 23): A cabbage butterfly and many different species of noctuids were seen in flight this season.

FALL ARMYWORM (Laphygma frugiperda S. & A.)

Georgia. P. M. Gilmer (January 16): L. frugiperda has been rather common at lights during this week at Tifton.

COMMON RED SPIDER (Tetranychus telarius L.)

Pennsylvania. H. F. Dietz (February 10): Red spider (T. telarius L.) has been a serious pest in greenhouses and in the large commercial rose-growing district around Philadelphia.

Mississippi. C. Lyle (February 24): T. telarius was damaging boxwood at McComb on January 27, arborvitae at Vardaman on January 16, and Norway spruce at Jackson early in February.

Louisiana. C. E. Smith (January 27): According to reports from the strawberry-growing district around Hammond, the red spider was abundant in January.

CEREAL AND FORAGE - CROP INSECTS

WHEAT

CHINCH BUG (Blissus leucopterus Say)

Indiana. C. M. Peckard (February 6): Chinch bug abundance in 1/5-square-foot samples of bunch grass taken by C. Benton from November 25 to December 5, 1936, from four northwestern counties of central Indiana was as follows:

County	Samples	Average bugs per square foot	Rating
	Number	Number	(Decker's scale)
Benton - - - - -	23	640	Moderate-abundant
Tippecanoe - - - - -	22	1,115	Very abundant
Clinton - - - - -	25	290	Moderate
Tipton - - - - -	25	65	Scant

Winter mortality of chinch bugs in 1/5-square-foot samples of bunch grasses, including a few timothy samples, taken by Mr. Benton in Tippecanoe County this winter, is shown in the following table. Mortality was about the same in timothy as in bunch grasses.

Date	Samples	Living bugs	Dead bugs
	Number	Number	Number : Percent
November 21 - - -	9	984	11 : 1
December 14 - - -	10	1,155	64 : 5
January 6 - - -	20	2,781	115 : 4
February 1 - - -	20	1,984	1,505 : *43

*This mortality general in Tippecanoe County.

J. J. Davis (February 23): Unless unfavorable weather appears between now and the time for chinch bugs to migrate to wheat and other small grains, we anticipate trouble on the western border of the State from Lake County on the north to Greene County on the south, and perhaps covering two tiers of counties from the western border.

Illinois. W. P. Flint (February 22): Chinch bugs brought in from hibernation the middle of January have shown a very high percentage of survival. These bugs have laid eggs which are now hatching in the greenhouse.

GREEN BUG (Europtera graminum Rond.)

South Carolina. T. L. Bissell (February 13): A farmer from Bamberg County in the south-central part of the State, says that he has had heavy losses from green bug on oats this winter.

Alabama. J. M. Robinson (March 1): Green aphids appeared on oats in large numbers in central Alabama, including Lee County.

Georgia. F. L. Bissell (February 22): The most important item this winter has been the outbreak of the green bug on oats and other grains. I have inspected 26 properties in 4 counties in central Georgia -- Spalding, Pike, Lamar, and Monroe -- in which I estimate that 5 percent of the oat crop has been destroyed. At the experiment station in Spalding County plots of wheat and barley have been heavily damaged, but on the nearby farms wheat is untouched. I find that the bugs are still spreading at the experiment station but decreasing on the farms. This is possibly explained by local protection from weather, that is, the cool weather of February seems to have checked the bugs, except possibly where they were protected by woods. The outbreak first came to my attention on January 23 but one farmer noticed it before Christmas.

O. I. Snapp (February 4): The green bug is unusually abundant at Fort Valley, Peach County, and has already caused considerable damage to wheat. Some wheat plants are dead as a result of the severe attack, and large areas in many fields are showing the effects of the feeding of this aphid.

Oklahoma. F. A. Fenton (February 23): In the first week in January we received reports of green bug damage to wheat in Garfield County, in the north-central part of the State. A number of fields showed evidences of severe infestation and in one field visited wheat had been killed in many spots.

SPOTTED CUCUMBER BEETLE (*Diabrotica duodecimpunctata* F.)

Georgia. O. I. Snapp (January 11): The hot weather of recent weeks has brought the 12-spotted cucumber beetle out of hibernation unusually early at Fort Valley. Many were observed on wing today, some of them being on wheat plants.

Louisiana. C. O. Eddy (March 1): Adults have been active and abundant several times during the winter.

ALFALFA

ALFALFA WEEVIL (*Hypera postica* Gyll.)

California. A. E. Michelbacher (February 23): On February 16 a survey was made of the alfalfa fields in the northwestern part of the San Joaquin Valley. No larvae or adults of the alfalfa weevil were collected. On January 3, before cold weather set in, a survey was made of alfalfa fields in the San Francisco Bay district. In most fields no larvae or adults of the alfalfa weevil were found, although in one field 12 larvae were collected in 300 sweeps. A second survey was made on February 22. In most fields no larvae or adults were collected. In one field an average of $1\frac{1}{2}$ alfalfa weevil larvae were collected per 100 sweeps. The surprising thing in this field was that an average of 10 adult *Bathyplectes curculionis* Thoms. was taken per 100 sweeps. Last year at this time the count of alfalfa weevil larvae ranged from 40 to 500, and the count of adults from 6 to 60.

CLOVER LEAF WEEVIL (Hypera punctata F.)

California. A. E. Michelbacher (February 23): On February 16 a survey was made of alfalfa fields in the northwestern part of the San Joaquin Valley. One clover leaf weevil larva was found. On February 22 about three clover leaf weevil larvae were taken to 100 sweeps in the San Francisco Bay district.

PEA APHID (Illinoia pisi Kalt.)

Georgia. T. L. Bissell (February 22): The pea aphid is common on Austrian winter peas at Experiment but seems to be less abundant than it was in January. In some spots peas that were thickly infested with aphids have died and the aphids must be at least partly responsible.

California. A. E. Michelbacher (February 23): The pea aphid was generally distributed through the alfalfa fields in the San Francisco Bay district on February 22.

COWPEAS

COWPEA CURCULIO (Calcodermus aeneus Boh.)

Georgia. T. L. Bissell (February 22): Adults of the cowpea curculio are found commonly under dead grass and leaves in last year's pea fields, but no active curculios have been found.

F R U I T I N S E C T S

APPLE

APPLE APHIDS (Aphididae)

New Hampshire. L. C. Glover (February 25): Eggs of the green apple aphid (Aphis pomi DeG.) are scarce on trees in well-cared-for orchards in Durham. They are numerous on some trees in uncared-for orchards.

Pennsylvania. H. T. Hodgkiss (March 2): Aphid eggs are comparatively scarce in apple orchards.

Virginia. W. J. Schoene (February 22): A few examinations indicate that eggs of apple aphids are unusually difficult to find.

CODLING MOTH (Carpocapsa pomonella L.)

Georgia. C. H. Alden (February 23): Larvae still in hibernation but no pupation to date in Habersham County, in northeastern Georgia.

Indiana. J. J. Davis (February 23): Large numbers of codling moths went into winter quarters and we may anticipate a heavy infestation if weather conditions are normal.

EASTERN TENT CATERPILLAR (*Hyalocossus americana* F.)

New York. E. P. Melt (February 25): Apple tent caterpillars (*H. americana*) were reported as hatching in small numbers last week at Riverdale just north of New York City. They are somewhat numerous here and there, though less abundant than last year.

SAN JOSE SCALE (*Aspidiotus perniciosus* Comst.)

New Hampshire. L. C. Glover (February 25): The San Jose scale is very scarce in Stratford and Rockingham Counties.

Illinois. W. P. Flint (February 22): C. Chandler has just completed some counts of San Jose scale in southern Illinois, which indicate that from 24 to 53 percent of the scale is surviving in different localities. An examination of scale in central Illinois the latter part of December showed about 60-percent survival. The weather on the whole has been very mild, favoring a high survival of scale.

Georgia. C. H. Alden (February 23): Owing to rainy winter and abnormally early swelling of the buds, many growers failed to apply dormant sprays and, as a result, the scale has not been properly controlled in some peach orchards in Habersham County, in northeastern Georgia.

Idaho. C. Wakeland (February 24): Only a few counts have been made of the conditions of overwintering San Jose scale, but these have shown 100-percent mortality in a community where the minimum temperature reached -30° F. It is probable that survival on bark above snow line will be low throughout the State, as temperatures in nearly all localities where the scale is established were lower than -25° , the temperature which has been found to effect complete kills in other winters.

EUROPEAN RED MITE (*Paratetranychus pilosus* C. & F.)

New Hampshire. L. C. Glover (February 25): The eggs of the European red mite (*E. pilosus*) are numerous on apple trees in Durham, particularly on younger trees.

Pennsylvania. H. E. Hodderiss (March 2): Eggs of the European red mite are abundant generally over the State.

PEACH

PLUM CURCULIO (*Conotrachelus nemoralis* Hbst.)

Georgia. O. I. Shapp (February 8): An adult curculio was caught today by jarring wild plum trees at Fort Valley. Wild plum trees are now in full bloom and peach trees are beginning to bloom, some having half of their blooms fully opened. This is the earliest date on which we have recorded the appearance of adult curculios from hibernation, although annual jarring records have been made for 20 years. We have taken plum curculios heretofore the latter part of February, but never as early as February 8. They usually begin to appear from hibernation in March. The records this year confirm those of other years in that the curculio begins to appear from hibernation when peach trees begin to bloom.

C. H. Alden (February 23): No beetles have emerged from hibernation in Habersham County, in northeastern Georgia.

ORIENTAL FRUIT MOTH (Grapholitha molesta Busch)

Indiana. J. J. Davis (February 23): In areas where there was a peach crop last year the oriental fruit worm is overwintering in rather large numbers.

PEACH BORERS (Conopia spp.)

Alabama. J. M. Robinson (March 1): Peach tree borers (C. exitiosa Say) were sufficiently abundant in central Alabama to require treatment of the trees.

Idaho. C. Wateland (February 24): A very heavy infestation of a peach borer is causing heavy damage to peach, prune, and apricot trees in Gen County. Injury is not just typical for that of C. exitiosa Say, commonly found in southwestern Idaho, as larvae are found abundantly in the trunk and even in the scaffold limbs. The species cannot be determined until adults are reared in the spring.

CHERRY SCALE (Aspidiotus forbesi Johns.)

Virginia. W. J. Schoene (February 22): In one orchard in the Roanoke section a large number of peach trees are rather severely injured by A. forbesi.

TERRAPIN SCALE (Lecanium nigrofasciatum Pers.)

Virginia. W. J. Schoene (February 22): In the Roanoke district we have in one peach orchard an outbreak of the terrapin scale (L. nigrofasciatum).

BLACKBERRY

BLACKBERRY MITE (Eriophyes essigi Hassan)

Washington. A. J. Hanson (February 23): The blackberry mite (E. essigi) is hibernating successfully.

GRAPE

GRAPE LEAFHOPPER (Erythroneura comes Say)

California. C. S. Morley (February 4): Grape leafhoppers are hibernating in Kern County in clumps of Russian-thistle and other weed growth and injury may be quite serious this spring if some winter control is not practiced.

CITRUS

CITRUS WHITEFLY (Dialeurodes citri Ashm.)

Florida. J. R. Watson (February 24): There is now a considerable flight, unusual at this time, of the citrus whitefly (D. citri) in Orange and Lake Counties.

Mississippi. C. Lile (February 24): Complaints and specimens from citrus trees were received from Bay Saint Louis on November 8, Ocean Springs on December 9, and De Lisle on January 6, all in the southern part of the State. Specimens from Cape jasmine were received from Canton in the central part of the State on January 15.

BLACK SCALE (*Aspidiotia oleae* Bern.)

California. R. S. Woglum (February 23): Unanimity of observations that the cold weather had not produced any outstanding scale mortality. There appears to be a slight increase of scale mortality on living wood, leaves, or fruit, especially of the smaller stage, owing to the cold and rain, but very little over that normal to any cool, wet winter. Where trees are defoliated, fruit destroyed and branches killed, this means a reduction of scale on the parts affected. As there is a rather large acreage of lemon orchards completely defoliated, with fruit loss and evidence of more or less dead wood, the scale is considerably reduced in such orchards. The acreage of orange or grapefruit orchards in the more scaly districts that have suffered heavy defoliation is comparatively small. Black scale at this time of year is largely on the twigs and branches. No increased mortality of black scale has been noted since the cold weather. Our records of 1922 show that, even in orange trees completely defoliated that year, there was little natural mortality. In fact, the following year there was one of the most severe black scale infestations ever noted in eastern Los Angeles County, and one that required 2 or 3 years to subdue.

CALIFORNIA RED SCALE (*Chrysomphalus aurantii* Mask.)

California. R. S. Woglum (February 23): Actual counts made since the freeze, of red scale on fruit from certain untreated orchards, in Los Angeles County showed an average of approximately 70 percent of the scale alive on lemons and 60 percent alive on oranges. This is comparable to normal mortality during cool, wet winters. One of the most important influences of the cold weather has been the complete checking of scale development and, in the case of red scale, being put in a condition more susceptible to control by fumigation.

H. J. Ryan (February 9): To such extent as defoliation caused by the freeze does occur, and where fruit loss from red scale in untreated lemon orchards ran 75 percent or more, there will be some decrease in red scale population in Los Angeles County. According to some scale counts, the percentage of red scale mortality now evident is somewhat greater than usual at this time of year. We cannot tell whether this is due to cold weather or to the speeding up of otherwise normal conditions.

FLORIDA RED SCALE (Chrysomphalus aonidum L.)

Florida. J. R. Watson (February 24): Full-grown crawlers of the Florida red scale are to be seen on citrus trees.

PURPLE SCALE (Lepidosaphes beckii Norm.)

Florida. J. R. Watson (February 24): Full-grown crawlers of the purple scale are to be seen on citrus trees.

California. R. S. Woglum (February 23): No marked mortality of purple scale eggs or insects has been noted. Our observations in 1913 and 1922 showed little influence of cold weather on mortality of this pest.

COTTONY-CUSHION SCALE (Icerya purchasi Mask.)

Alabama. J. M. Robinson (March 1): The cottony-cushion scale was reported on January 20 as attacking shrubbery at Livingston, Sumter County, in the west-central part of the State.

Mississippi. C. Lyle (December 9): I. purchasi on Satsuma at Pass Christian, in Harrison County, on the Gulf coast.

A TREE BORER (Prionus sp.)

Arizona. D. C. George (January 20): The large grubs of a longhorn borer, probably P. californicus Mots., was found tunneling in the roots of citrus trees and around the crowns at Phoenix. Considerable damage observed in one grove.

CITRUS RUST MITE (Phyllocoptes oleivorus Ashm.)

Florida. J. R. Watson (February 24): Rust mites have been troublesome all winter and much spraying has been done.

CITRUS RED MITE (Paratetranychus citri McG.)

Florida. J. R. Watson (February 24): The purple mite has been numerous on citrus.

TRUCK - CROP INSECTS

VEGETABLE WEEVIL (Listroderes obliquus Klug)

- South Carolina. W. J. Reid (February 2): On February 2, larval, pupal, and adult specimens of the vegetable weevil were brought in with the statement that the insect was severely damaging about 25 percent of the plants in a 3-acre planting of carrots in Charleston County. Additional adults appeared among the caged specimens on February 16. The vegetable weevil was first reported from Charleston County in January 1935.
- Florida. F. S. Chamberlin (January 25): Specimens collected on turnips at Quincy, Gadsden County, in north-central Florida. This pest now occurs in abundance in widely separated places in this county.
- Georgia. T. L. Bissell (January 13): A heavy infestation of vegetable weevils has developed at the experiment station in Spalding County, central Georgia. The insect was rare here a year ago. We have found approximately 25 grubs to the square foot in two turnip patches. As yet we find no pupae out of doors, although larvae collected January 13 and brought indoors have become adults.
- Alabama. J. M. Robinson (March 1): The vegetable weevil was very active during the winter and was doing serious damage in the southern and central parts of the State, being reported as far north as Auburn and Lafayette. In many places the turnip foliage and tubers were destroyed. Adults had formed as early as January 22.
- Mississippi. K. L. Cockerham (January 23): The vegetable weevil has appeared in greater numbers and is doing more injury in the vicinity of Biloxi station on the coast this season than for several years. Injury began to show up the latter part of December and has increased throughout January. The infestation has shown rather constant increase up to the present time. On some other truck farms where examinations were made severe injury and heavy populations of larvae were found. On many small turnip plants 8 and 10 larvae were found on single leaves, 21 being counted on 1 leaf. Severe injury has been noted on turnips, carrots, chinese cabbage, and cabbage plants, and some injury on mustard, chinese turnips, rutabaga, and radishes. Many of the larvae hatched first are now in the pre-pupal and pupal stages, although recent examinations revealed many young larvae still present.
- C. Lyle (February 24): The vegetable weevil has been about normally abundant in central Mississippi during the past winter.
- Louisiana. P. K. Harrison (January 27): The heaviest infestation of the vegetable weevil observed in a number of years is reported in the neighborhood of Baton Rouge.
- Texas. P. K. Harrison (January 15): Heavy infestation of the vegetable weevil attacking turnip plants in Harrison County in northeastern Texas. No other plants examined.

FLOWER THRIPS (Frankliniella spp.)

Louisiana. C. O. Eddy (March 1): F. fusca Hinds has been moderately abundant on onions and shallots and present in small numbers on cabbage. F. tritici Fitch is now beginning to build up.

POTATO

POTATO FLEA BEETLE (Epitrix cucumeris Harr.)

Washington. A. J. Hanson (February 23): The potato flea beetle (E. cucumeris) becomes a little more serious each season throughout the State. The insect is now a problem from Snohomish County on the north, over southwestern Washington, and into the Willamette Valley of Oregon. East of the Cascade Mountains it has become a problem in the Ellensburg, Kittitas County, district, and in parts of Yakima County. In the Puget Sound district the potato acreage and the number of farmers growing the crop continue to vary.

BEANS

MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

Colorado. R. L. Wallis (February 24): Examinations of hibernating bean beetles at Grand Junction at weekly intervals during the month of February showed that on the average 13.78 percent of the beetles were alive.

CABBAGE

DIAMONDBACK MOTH (Plutella maculipennis Curt.)

South Carolina. W. J. Reid (February 16): On January 23 approximately full-grown larvae of the cabbage looper (Autographa brassicae Riley) and of the diamondback moth (P. maculipennis Curt.) were found on a midwinter cabbage planting in the vicinity of Charleston. Activity of the worms decreased somewhat during periods of lower temperatures existing during the last few days of January and the early part of February; however, the population of the diamondback moth increased to such an extent by February 16 as to cause severe damage to winter cabbage plantings. There is a probability of more than usual injury to the spring plantings.

Louisiana. C. E. Smith and R. W. Brubaker (January 27): The larvae of the diamondback moth are increasing in abundance around Baton Rouge. At present they are doing more damage to cabbage than any of the common cabbage worms.

Texas. F. L. Thomas (February 24): The diamondback moth (P. maculipennis) and the cabbage looper (A. brassicae) are abundant on cabbage and broccoli in Hidalgo County, in the lower Rio Grande Valley and in Dimmit and Galveston Counties.

CABBAGE LOOPER (Autographa brassicae Riley)

Florida. J. R. Watson (February 24): Cabbage loopers have been unusually common.

Louisiana. C. E. Smith and R. W. Brubaker (January 27): The cabbage looper is not very abundant at Baton Rouge.

CABBAGE WEBWORM (Hellula undalis F.)

Georgia. T. L. Bissell (February 22): Collards and turnips were seriously infested with webworm last fall but are now free from it.

Mississippi. D. W. Grimes (November 25): Specimens of H. undalis were collected at Durant on November 25.

IMPORTED CABBAGE WORM (Ascia rapae L.)

Louisiana. C. E. Smith and R. W. Brubaker (January 27): The imported cabbage worm is increasing in abundance at Baton Rouge. Large numbers of the adults were seen on the wing on January 13 and 20. They are now less numerous.

HARLEQUIN BUG (Murgantia histrionica Hahn)

Texas. F. L. Thomas (February 15): Harlequin cabbage bugs put in their appearance on February 15 in the Winter Garden district of southwestern Texas, attacking cabbage and related crops.

PEAS

PEA MOTH (Laspeyresia nigricana Steph.)

Washington. A. J. Hanson (February 23): The pea moth is hibernating successfully. Twenty thousand cocoons are being held in an outdoor insectary and observations will be made during the emergence period. The cocoons that have been opened recently contain normal larvae.

SQUASH

SQUASH BUG (Anasa tristis Deg.)

California. C. S. Morley (February 4): We are finding a great many squash bugs in Kern County and this insect has caused some damage to cotton, melons, squash, and pumpkin.

TURNIP

TURNIP APHID (Rhopalosiphum pseudo-brassicae Davis)

Louisiana. P. K. Harrison (January 27): The turnip aphid was present in injurious numbers from October 15 to December 30, 1936, at Baton Rouge. The parasitic fungus Entomophthora aphidis has since greatly reduced the population.

Texas. F. L. Thomas (February 24): Turnip lice appeared on turnips at College Station throughout the winter.

STRIPED FLEA BEETLE (Phyllotreta vittata F.)

Louisiana. P. K. Harrison (January 27): This insect is scarce on turnips and mustard in the vicinity of Baton Rouge.

CELERY

CELERY LEAF TIER (Phyllocnistia rubiginella Guen.)

Florida. C. B. Wisecup (February 10): Climatic conditions have been very favorable for the development of this insect at Sanford, in Seminole County, east-central Florida, but due to various counteracting influences, the number present in January is the lowest ever observed at this season since the station was established in 1925.

GARDEN FLEA HOPPER (Halticus citri Ashm.)

Florida. C. B. Wisecup (February 10): Numbers not increasing at Sanford but as the celery is harvested the adults are being concentrated in the remaining celery.

ONIONS

ONION THRIPS (Thrips tabaci Lind.)

Florida. C. B. Wisecup (February 10): In years of high temperatures and lack of rainfall this insect is a factor in limiting the quality and quantity of celery at Sanford late in the spring. In January small celery was being severely damaged.

Louisiana. C. O. Eddy (March 1): T. tabaci is present in small numbers on onions.

Texas. F. L. Thomas (February 24): Onion thrips are abundant on onions in Dimmit County, on the Rio Grande.

CARROT

CARROT RUST FLY (Psila rosae F.)

Washington. A. J. Hanson (February 23): The distribution of the carrot rust fly now includes the area from the Canadian border on the north to Lewis County on the south, in the Puget Sound district. The range of distribution of the insect has been extended from the White River Valley to the north and approximately 100 miles south since it was first reported in 1929. The third generation of adults continued to emerge until January 1, that is, specimens maintained in an outdoor insectary.

Washington. R. L. Webster (February 23): This insect has been discovered at Winlock in Lewis County, the most southern record.

SPINACH

BEEF LEAFHOPPER (Eutettix tenellus Bak.)

Texas. F. L. Thomas (February 24): The beef leafhopper appeared only in small numbers during the past winter on spinach in the Winter Garden district of southwestern Texas. The insect is present also in Hidalgo County, in the lower Rio Grande Valley of this State, but is causing only slight injury to spinach.

SWEETPOTATO

SWEETPOTATO LEAF BEETLE (Tropophorus viridicyaneus Cr.)

Alabama. K. L. Cockerham (December 10): On December 9 and 10 an investigation was made in Mobile County of an infestation in sweetpotatoes. The insect had been found on five farms growing a little over 5 $\frac{1}{2}$ acres of potatoes during the fall. In most cases the injury was reported as not being severe. On one or two farms, however, the damage was rather severe. Approximately 5 bushels of potatoes were destroyed on one farm. On another approximately 3 percent of the potatoes remaining in storage had been damaged by larvae and this grower reported that the part of the crop already consumed had also been injured.

PEPPER

PEPPER WEEVIL (Anthonomus eugenii Cano)

Florida. J. R. Watson (February 24): The few pepper weevils surviving the clean-up campaign of last winter have been increasing in numbers in Manatee County, in west-central Florida.

MUSHROOMS

A FLY (Sciara sexdentata Petty)

North Dakota. J. A. Munro (December 31): Sciariid flies are abundant in a greenhouse mushroom bed at Fargo. (Specimens determined by F. R. Shaw as S. (Neosciara) sexdentata Petty.)

TOBACCO

TOBACCO FLEA BEETLE (Ebitrix parvula F.)

South Carolina. N. Allen (February 23): This pest was found feeding on plants in plant beds near Loris on February 23. Weather was unseasonably warm during January, resulting in early germination of tobacco seed and comparatively large plants for this season of the year. The appearance of the tobacco flea beetle is unusually early.

Florida. F. S. Chamberlin (February 25): A few flea beetles are present in tobacco plant beds in Gadsden County, but they have caused no damage of commercial importance.

MOLE CRICKETS (Scaeteriscus spp.)

Florida. F. S. Chamberlin (February 25): Mole crickets have caused a small amount of damage in tobacco plant beds in Gadsden County. In January it appeared that considerable damage would be caused, but the cooler weather of February seemed to check the activities of the crickets.

COTTON INSECTS

BOIL WEEVIL (Anthonomus grandis Boh.)

Mississippi. C. Lyle (February 24): Inspector D. W. Grimes of Durant reports that the first boll weevils emerging from hibernation cages were found on the screens during a warm period during the first week of February.

(January):

Louisiana. R. C. Gaines and G. L. Smith / Much more boll weevil activity reported in the hibernation cages at Tallulah this January than last year. In 70 comparable cages 1,029 weevils were active in January of this year, whereas only 51 were observed in January 1936. During January 1937 the temperature was below 32° F. only twice, the minimum for the month being 29°, whereas during January 1936 the temperature dropped below 32° on 16 dates with a minimum of 15°. One weevil was caught on the flight screens, as compared to none last year, 12 in January 1935, and 11 in January 1934.

Texas. F. L. Thomas and T. C. Barber (February 24): Boll weevils have been active and breeding throughout the winter in the lower Rio Grande Valley, where cotton has remained green.

R. W. Moreland (January): Reports 221 boll weevils alive in hibernation at College Station during January 1937, as compared to 1,419 in January 1936. The month was not as cold as last year but the temperature was much more uniform and without the warm spells that brought the weevils out of hibernation in 1936.

PINK BOLLWORM (Pectinophora gossypiella Saund.)

Texas. A. J. Chapman (February 6): At Presidio the cylinder examinations that were made in January to determine the progressive mortality in bolls indicated that there has been a lower mortality than normal. Mortality was over 95 percent in bolls buried and irrigated in December.

COTTON FLEA HOPPER (Psallus seriatus Reut.)

Texas. F. L. Thomas (February 24): Cotton flea hoppers began to hatch on February 17 in weeds that were in hibernation cages. This is more than 2 weeks earlier than usual. A few nymphs were found in the field at College Station on February 23.

H. J. Crawford (February): From 6 plants of Tidestromia lanuginosa collected at Brownsville on February 8, flea hoppers began to emerge on February 9 and 863 nymphs had emerged by the end of the month. The first nymphs were collected in the field on February 25 from horsemint and other plants growing within 4 feet of Tidestromia. Of the 35 nymphs, 4 were fourth instars and the others smaller. None were found on plants 30 feet distant from Tidestromia or on small cotton.

FOREST AND SHADE - TREE INSECTS

GYPSY MOTH (Porthetria dispar L.)

Pennsylvania. A. F. Burgess (February 8): On January 20 an infestation was located just outside of the quarantined area in the northeastern part of Clinton Township, Wayne County, Pa. A total of 99 new egg clusters have been located there in growth, most of which is considered unfavorable for the development of gypsy moth infestation. Clinton Township borders Dyberry Township, where an infestation of approximately 325 egg clusters was recently found.

New York. A. F. Burgess (February 8): Intensive scouting and treatment work continued in the region of the Shawangunk infestation in Ulster County, N. Y. Up to January 23 a total of 15,050 egg clusters had been located and destroyed in Putnam Valley, Putnam County, N. Y. The limits of this infestation have not yet been found.

FALL CANKERWORM (Alsophila pometaria Harr.)

New York. M. Kisliuk (December 15): In a wooded area in Alley Pond Park, Long Island, on December 13 male moths were actively fluttering up and down on the sunny side of several red oak trees. There must have been about 200 adults on about 5 large trees. Closer observation revealed the fact that there were also numerous wingless females slowly moving about in the crevices of the bark. The unusual spectacle of insects of this type mating at this time of the year in this locality was indeed a surprise. (Det. J. F. G. Clarke.)

Northeastern States. E. P. Felt (February 25): Fall cankerworm moths have been crawling during the milder periods of the winter in the northeastern section of the United States. Within the last few days, a living moth was received from Philadelphia, Pa.

EUROPEAN FRUIT LECANIUM (Lecanium corni Bouche)

Oklahoma. F. A. Fenton (February 23): European fruit lecanium still promises to be a considerable pest to shade trees this year and we have received a number of requests for information on control measures. The insect is still in the overwintering larval stage on the branches of the trees.

LARCH

LARCH CASEBEARER (Coleophora laricella Hbn.)

New Hampshire. L. C. Glover (February 25): The larch casebearer is numerous in Strafford County in southeastern New Hampshire.

OAK

GOLDEN OAK SCALE (Asterolecanium variolosum Ratz.)

New York. R. E. Horsey (February): A young tree of the sargent oak (Quercus sargentii) was found to be badly pitted with this scale at Rochester.

PINE

PITCH-MASS BORER (Parharmonia pini Kellicot)

Georgia. T. O'Neill (January 22): Larvae were attacking large pines in mountainous section of northern Georgia, in Union County. (Det. by C. Heinrich.)

PINE NEEDLE SCALE (Chionaspis pinifoliae Fitch)

New Hampshire. L. C. Glover (February 25): Many mugho pines in Durham, Strafford County, are heavily infested with pine leaf scale.

TUNG-OIL TREE

OBSCURE SCALE (Chrysomphalus obscurus Comst.)

Mississippi. C. Lyle (February 24): C. obscurus on tung at Bendale, on February 15.

I N S E C T S A F F E C T I N G G R E E N H O U S E

A N D O R N A M E N T A L P L A N T S

GREENHOUSE STONE CRICKET (Tachycines asynamorus Adel.)

North Dakota. F. G. Butcher (February 20): A cricket, T. asynamorus, established in some greenhouses in Fargo, is causing injury to young flax plants. The injury, which occurs only of nights, is characterized by extensive chewing on the cotyledons of the plants just after they emerge from the soil. Older plants are rarely attacked.

A LONG-HORNED BEETLE (Oberea sp.)

Alabama. J. M. Robinson (March 1): A long-horned beetle, Oberea sp., was reported from Talladega on October 29 as attacking Photenia and English laurel.

GREENHOUSE WHITEFLY (Trialeurodes vaporariorum Westw.)

Maryland. E. N. Cory (February 12): Reported attacking house plants at Raspeburg, Baltimore.

MEALYBUGS (Pseudococcus spp.)

Maryland. E. N. Cory (February 12): Reported attacking house plants at Raspeburg, Baltimore.

Tennessee. G. M. Bentley (February 23): Greenhousemen have had considerable trouble with this insect.

SPRUCE GALL APHID (Chermes abietis L.)

Maryland. E. N. Cory (January 22): Reported on evergreens at Baltimore.

CAMPHOR TREE

AVOCADO RED MITE (Paratetranychus yothersi McG.)

Florida. J. R. Watson (February 24): Infestation of Tetranychus yothersi was unusually heavy and most camphor trees have been thoroughly browned.

CEDAR

PALES WEEWIL (Hylobius pales Hbst.)

Mississippi. C. Lyle (February 24): Specimens were collected by Inspector D. W. Grimes on Cedrus deodara plants from six properties at Kosciusko and one at Goodman during the winter.

A WEEWIL (Pachylobius picivorus Germ.)

Mississippi. C. Lyle (February 24): Specimens on Cedrus deodara were collected from properties at Kosciusko and Goodman by Inspector D. W. Grimes on November 28.

DEODAR WEEWIL (Pissodes deodarae Hopk.)

Mississippi. C. Lyle (February 24): A number of infestations on Cedrus deodara were found by Inspector D. W. Grimes during November, December, and January at Kosciusko. At least 10 properties were infested.

LILAC

OYSTERSHELL SCALE (Lepidosaphes ulmi L.)

New York. R. E. Horsey (February): A careful survey in February of an ornamental planting at Rochester, of over 600 lilac shrubs from 4 to 7 feet high, showed heavy infestation. Several shrubs were completely covered. This planting was inspected in the summer of 1935 and the recent survey discloses a gain of over 6 percent in the number of shrubs with scale and a heavier infestation on individual shrubs. This planting was given a dormant spray in the spring of 1936, which did not check the infestation. Another planting of over 500 old shrubs showed only 1 shrub with much infestation and 8 others with a little scale. This planting has had little spraying recently but was carefully sprayed both in summer and early spring and was cleared of most all scale in past years. The scale appears to spread more rapidly on strong vigorous young shrubs than on old rough-barked limbs of large bushes.

LILIES

A BULB MITE (Acarina)

Alabama. J. M. Robinson (March 1): A bulb mite was reported attacking Easter lilies in Mobile on February 23. Associated with this mite were nematodes and a few thrips, the mites being more abundant and destructive apparently than the other pests.

MAGNOLIA

MAGNOLIA SCALE (Neolecanium cornuparvum Thro)

New York. R. E. Horsey (February): A shrub of Magnolia liliflora at Rochester that was frozen nearly to the ground in the cold winter of 1933-34 and has thrown up numerous strong shoots to a height of about 4 feet was found to have these shoots almost covered with the partly grown overwintering scale. Caps of the old, last-year's scale can be found in abundance at the base of this shrub.

ORCHIDS

A THRIPS (Taeniothrips xanthus Williams)

Maryland. E. N. Cory (February 2): This thrips, determined by J. R. Watson, was found on orchids in greenhouse at Jessup, Anne Arundel County. (This thrips has been reported by J. R. Watson on orchids in the West Indies.)

STOCKS

DIAMONDBACK MOTH (Plutella maculipennis Curt.)

Colorado. C. W. Wade (December 15): The diamondback moth was discovered on stocks in a greenhouse at Denver on December 15. It had caused considerable loss to some of the growers. This is the first record of this insect attacking stocks in this immediate locality.

INSECTS ATTACKING MAN AND
DOMESTIC ANIMALS

MAN

MOSQUITOES (*Culicinae*)

Tennessee. G. M. Bentley (February 23): Insects seen in flight this season; some Culex sp. and Anopheles spp. in entrances to caves.

PUSS CATERPILLAR (Megalopyge opercularis S. & A.)

Alabama. J. M. Robinson (March 1): On October 29 a puss moth larva was sent to this office from Headland. A woman had been to see the doctor as a result of coming in contact with the poisonous bristles of this larva.

SWINE

HOG LOUSE (Haematopinus suis L.)

Tennessee. G. M. Bentley (February 23): Where care has not been taken hog growers are having some trouble with this pest.

HOUSEHOLD AND STORED-PRODUCTS INSECTS

TERMITES (Reticulitermes spp.)

Indiana. J. J. Davis (February 23): Usually we have numerous letters about termites during their swarming period, beginning in January and continuing for several months. This year we have received very few letters indicating swarming.

Michigan. E. I. McDaniel (February 16): Have received first shipment of termites for 1937. They are on the wing in Kalamazoo. This is not to be wondered at, as we have had a remarkably open winter.

Maryland. E. N. Cory (January 21): Observed in the basement of a house at Baltimore.

District of Columbia. F. C. Craighead (February 9): Owing to the unusually warm weather that prevailed throughout January, winged termites swarmed in several buildings in the vicinity of Washington, D. C., during the last few days of the month. This is about 4 weeks earlier than usual.

Tennessee. G. M. Bentley (February 23): The termite problem seems to be a constant one.

Alabama. J. M. Robinson (March 1): Termites were swarming at Auburn on February 20; also at Waverly.

Mississippi. C. Lyle (February 24): On October 20, a correspondent at Lake, in central Mississippi, reported that termites had destroyed his crop of peanuts for the past 5 years. During the winter complaints were received from Newton, McComb, New Albany, Satartia, Kosciusko, Coldwater, Greenwood, Yazoo City, Cleveland, and Marks. State Plant Board inspectors also received many complaints.

Oklahoma. F. A. Fenton (February 23): Usual number of inquiries concerning termite control.

Texas. F. L. Thomas (January 8): Termites reported to be in a dwelling at Big Spring, in Howard County.

BOXELDER BUG (Leptocoris trivittatus Say)

Maryland. E. N. Cory (January 26): Found in houses in Salisbury, Wicomico County, and Brooklandville, Baltimore County.

G. Myers (February 26): The boxelder bug has been observed crawling around in a house from time to time since Christmas, at Avery, in Montgomery County.

Alabama. J. M. Robinson (March 1): Large numbers of boxelder bugs appeared at one or two residences in Gadsden the last week of October and first week of November. The county agent reported that the south sides of two or three houses were practically covered with these insects. Apparently they were congregating for hibernation. They were so abundant that they were considered a serious pest by the occupants of the residences.

Utah. G. F. Knowlton (February 19): Boxelder bugs have survived the winter in large numbers and are causing household annoyance in many homes and school buildings in northern Utah.

ANTS (Formicidae)

Maryland. E. N. Cory (January 28): Red ants in the kitchen and flying pavement ants in the basement of a house at Baltimore.

Illinois. W. P. Flint (February 22): The yellow ant (Lasius interjectus Say) is beginning to swarm in basements and we are now getting frequent reports of its presence. The swarms are often mistaken for termites.

RAISIN MOTH (Ephestia figulilella Greg.)

California. H. C. Donohoe (January 13): Samples of prunes were taken on October 10 in Solano County, from fruit boxed over night from the drying yard and from fruit stored for about 3 weeks in an open bin in a shed adjoining the drying yard. In a recent examination 54.9 percent of the boxed and 100 percent of the binned fruit showed feeding injury. These are our first records from a ranch of infestation in prunes after drying.

FIG MOTHS (Sphestia cautella Walk.)

North Carolina. W. D. Reed (January 5): Several moths were collected from a light trap located in a tobacco warehouse in Wilson, which was filled with flue-cured cigarette tobacco. This is the first record of this species from a tobacco warehouse and inspections are being made to determine whether the insect is infesting the tobacco. (Det. by C. Heinrich.)

TISSUE PAPER BUG (Thyrodrias contractus Mots.)

Illinois. C. L. Metcalf (January 15): Two reports of the tissue paper bug (T. contractus), one coming from Chicago and the other from the nearby town of Cicero. The pest was first reported, in Illinois, so far as the correspondent knows, from Chicago in January 1933.

A BORER (Dinoderus minutus F.)

Indiana. J. J. Davis (March 1): A local fruit market handed us some bamboo baskets which were infested with a scolytid larva. These baskets were imported from Japan about a year ago and apparently the insects showed up only recently. (Det. by W. S. Fisher.)

BORERS (Cerambycidae)

Maryland. E. N. Cory (January): Hylotrupes bajulus L. was collected in joists of a house, at Raspeburg, Baltimore, on January 22. Anacomis lignea F. was collected in rafters in a basement in Baltimore on January 30.

WEEVILS (Bruchus spp.)

Tennessee. G. M. Bentley (February 23): The Bruchus sp. attacking the garden-bean seed, soybeans, and cowpeas seems to be about the same as usual, and we have had several requests for remedial measures.

F O R E I G N N O T E S

Brazil. G. N. Wolcott (January 19): Following an exceptionally long, hot, and unbroken dry season from June to January the initial heavy rain of the wet season, which began on January 17, became a drizzle on the 18th, filling the air with termites, by the 19th brought an invasion of crickets, Gryllus assimilis F., to the most brilliantly lighted section of Belém (Para). Dozens of these crickets flew into every room and as many flew round and round under every street light. Both males and females were present in about equal abundance, and a few were still present 2 weeks later.

Egypt. A. H. Rosenfeld (January 31): A coccid new to Egypt, Lecanium acuminatum Sign., has become established in one of the country's largest mango groves, of about 3,000 trees, in the Delta.

ALFALFA WEEVIL SURVEY,¹ FALL OF 1936

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Bureau of Entomology and Plant Quarantine
U. S. Department of Agriculture

PURPOSE OF SURVEY

Fall survey of alfalfa weevil abundance was initiated in 1932 in order to indicate the outlook for damage in the following year and to build a reliable record of annual regional abundance which may later be used in studying effects of climate on the weevil. The abundance of overwintering cocoons of the larval parasite Bathyplectes curculionis Thos. was obtained from survey samples and the percentage viability of these was determined by dissection.

EXTENT OF SURVEY

Districts surveyed were restricted to those regions most important both in regard to alfalfa and to prevalence of weevil damage in recent years. Twelve districts were surveyed. These included parts of Oregon, Idaho, Colorado, Nevada, Utah, and Nebraska. The sampling plan was modified from that used in previous years in that the number of samples per field were reduced and the number of fields in a district were increased. Four samples were taken in each field and 25 fields in each district. This gave a less accurate figure for each field but a more useful indication of the general level of weevil abundance in a region.

¹Hypera postica Gyll.

²The work on which this report is based was carried out under the direction of J. C. Hamlin. The author was assisted by F. V. Lieberman, R. C. Newton, R. W. Bunn, and L. J. Jones.

METHODS

Each sample consisted of all trash, alfalfa crowns, and soil to a depth of 2 inches inside a metal die 1 foot square. The volume of samples was reduced by washing, so that weevils, parasite cocoons, and a small amount of litter remained in the lower of two screen-bottom tubs. Washed samples were wrapped in absorbent paper towels and, when dry, were examined in the laboratory.

LIMITATIONS ON USE OF DATA

A mean of two adults per square foot is considered necessary to produce economic damage in most of the older weevil-infested territory. However, the extent of damage in any locality is subject to modification by the character of the spring weather; that is, the severity of damage depends on whether the weather is favorable or unfavorable for weevil development. Field conditions, such as thin stands and poor growth, may also modify damage in any field and in any district where such conditions are prevalent, because fewer adults will produce the larval concentration necessary to cause damage. Furthermore, injury in any field having menacing numbers of adults is increased by delay in cutting, owing to unfavorable haying weather or to interference with other farm duties, after the plants are mature. This is indicated by the appearance of basal shoots and scattered blossoms.

RESULTS

Results follow according to States, accompanied by brief discussions of the areas surveyed and the extent of damage in 1936. The sampling data are tabulated by districts and each tabulation is accompanied by a brief interpretation. All averages have reference to areas of 1 square foot.

OREGON

Damage in Oregon last season was prevalent in Jackson County and in Eagle Valley, Baker County; consequently these areas were surveyed in the fall. Although there was virtually no damage in Malheur County, some of the farmers thought that the weevil might be building up to damaging populations again. For this reason Malheur County was also surveyed, being treated with Eagle Valley as one district.

Eagle Valley, Baker County.-- Adult populations were small indicating only slight damage next season. Only three fields showed populations of one or more adults, which normally would not be sufficient to cause damage, but in this area slight injury may occur in the hillside fields, owing to thin stands and poor growth. Cocoons of B. curculionis were rather scarce but, in view of the rather small weevil populations this parasite promises to be

effective in minimizing the production of adults in 1937. Results of the survey in Eagle Valley, sampled on October 10, are shown in the following table.

Field No.	<u>H. postica</u>		<u>B. curculionis cocoons</u>	
	adults		Present	Viable
	Number		Number	Percent
1 - - - - -	1.00	:	2.00	62.50
2 - - - - -	.25	:	2.75	45.45
3 - - - - -	0	:	1.75	42.86
4 - - - - -	.75	:	2.00	12.50
5 - - - - -	.75	:	1.50	0
6 - - - - -	1.00	:	6.00	16.67
7 - - - - -	.75	:	3.25	0
8 - - - - -	.50	:	1.00	25.00
9 - - - - -	.75	:	2.50	50.00
10 - - - - -	1.25	:	2.75	45.45
11 - - - - -	.50	:	1.50	83.33
12 - - - - -	.50	:	.75	56.67
Average -	0.67	:	2.31	32.43

Malheur County.--Weevil adults were extremely scarce, being found in only three fields and averaging only 0.08, which indicated no damage for 1937. B. curculionis cocoons were scarce, averaging only 0.96, but this average is large, compared with the weevil population. Results of the survey in Malheur County, sampled on October 11-12, were as follows:

Field No.	<u>H. postica</u>		<u>B. curculionis cocoons</u>	
	adults		Present	Viable
	Number		Number	Percent
1 - - - - -	0	:	0	--
2 - - - - -	0.25	:	0.25	100.00
3 - - - - -	0	:	.75	33.33
4 - - - - -	.25	:	2.00	37.50
5 - - - - -	0	:	0	-
6 - - - - -	0	:	.25	0
7 - - - - -	.50	:	.25	0
8 - - - - -	0	:	.50	50.00
9 - - - - -	0	:	1.25	20.00
10 - - - - -	0	:	.50	0
11 - - - - -	0	:	3.50	23.57
12 - - - - -	0	:	2.75	81.82
13 - - - - -	0	:	.50	50.00
Average -	0.08	:	0.96	42.00

Jackson County.-- Adult populations indicated that about one-fifth of the fields will be damaged in 1937. Populations necessary to produce damage are not definitely known, but more adults are required than in the older infested areas, because of climatic factors. The recently introduced parasite has spread rapidly, cocoons having been recovered in 18 of the 25 fields

surveyed. Although the populations are still small, they have increased satisfactorily to date. In the following table are shown the results of the survey in Jackson County, sampled from October 14 to November 14.

Field No.	<i>H. postica</i>		<i>B. curculionis</i> cocoons	
	adults		Present	Viable
	Number		Number	Percent
1 - - - - -	1.00		7.75	29.03
2 - - - - -	.25		.50	0
3 - - - - -	.50		1.75	14.28
4 - - - - -	.25		0	--
5 - - - - -	.25		0	--
6 - - - - -	1.00		.50	50.00
7 - - - - -	2.25		.25	100.00
8 - - - - -	2.00		4.50	61.11
9 - - - - -	2.00		2.75	90.91
10 - - - - -	2.75		.25	0
11 - - - - -	.50		1.00	75.00
12 - - - - -	.75		0	--
13 - - - - -	1.50		.25	100.00
14 - - - - -	1.00		1.50	50.00
15 - - - - -	.50		0	--
16 - - - - -	1.25		.25	0
17 - - - - -	1.75		1.00	25.00
18 - - - - -	2.25		1.00	25.00
19 - - - - -	1.50		1.25	40.00
20 - - - - -	.75		.25	100.00
21 - - - - -	.50		0	--
22 - - - - -	.50		.25	100.00
23 - - - - -	0		0	--
24 - - - - -	.25		0	--
25 - - - - -	.50		.75	100.00
Average -	1.03		1.03	36.60

IDAHO

Damage in Idaho last season was negligible, less than 1 percent of the fields being injured. However, larval populations were sufficient to, possibly, produce damaging numbers of adults in both the eastern and western parts of the State; and consequently these areas were surveyed last fall.

Eastern Idaho.-- The survey in eastern Idaho covered parts of five counties, Bingham and Bonneville Counties being considered as a subdistrict and Jefferson, Madison, and Fremont Counties as another. These divisions were deemed necessary because of differences in climate, the three northern counties invariably having colder winters and more snow than the other two. Although the entire eastern section is considered a two-crop area, occasionally, as was the case this season, three crops can be cut in the two southern counties. In the northern counties, particularly Madison and Fremont, only two crops are cut in any season. Adult populations indicate only slight damage in 1937, menacing populations being present in less than one-fifth of the fields.

B. curculionis cocoons were rather scarce but this parasite promises to be effective next season. The following table shows results of the survey in Bonneville and Bingham Counties, sampled on September 22-24.

Field No.	<u>H. postica</u>	<u>B. curculionis cocoons</u>	
	adults	Present	Viabile
	Number	Number	Percent
1 - - - - -	3.25	3.25	46.15
2 - - - - -	1.50	6.75	14.81
3 - - - - -	2.00	3.50	35.71
4 - - - - -	.50	23.25	12.90
5 - - - - -	.50	8.50	8.82
6 - - - - -	.75	.75	66.67
7 - - - - -	.25	0	--
8 - - - - -	.50	.50	50.00
9 - - - - -	0	0	--
10 - - - - -	.25	.25	0
11 - - - - -	.25	.50	50.00
12 - - - - -	.75	10.75	30.23
13 - - - - -	.50	15.50	6.45
Average -	0.85	3.60	26.74

Adult populations indicate considerable damage in 1937, menacing populations being present in almost half of the fields. B. curculionis cocoons averaged 5.85 per square foot and may be sufficiently numerous to be effective, at least during the early part of the 1937 season. In the next table are given results of the survey in Fremont, Madison, and Jefferson Counties, sampled on September 22-24.

Field No.	<u>H. postica</u>	<u>B. curculionis cocoons</u>	
	adults	Present	Viabile
	Number	Number	Percent
14 - - - - -	1.00	3.75	0
15 - - - - -	.25	1.00	50.00
16 - - - - -	.25	6.25	12.00
17 - - - - -	1.25	14.00	10.71
18 - - - - -	.50	1.00	25.00
19 - - - - -	.25	4.28	47.06
20 - - - - -	2.00	1.25	20.00
21 - - - - -	4.50	8.25	12.12
22 - - - - -	2.25	3.75	33.33
23 - - - - -	1.75	15.50	4.84
24 - - - - -	2.50	4.50	22.22
25 - - - - -	2.75	6.75	7.41
Average -	1.60	5.85	13.88

Canyon County.--Observation in the lower Snake River Valley of western Idaho last season revealed comparable conditions in Ada, Gem, Canyon, Payette, and Washington Counties. As a result, the fall survey was limited to Canyon County, which contained the largest alfalfa acreage. Adult populations were small, no fields having menacing numbers. B. curculionis cocoons were scarce

but, in view of the small weevil populations, the parasite promises to be effective in 1937. Results of the survey in Canyon County, sampled on October 13-15, were as follows:

Field No.	<u>H. postica</u>		<u>B. curculionis cocoons</u>	
	adults		Present	Viabie
	Number		Number	Percent
1 - - - - -	0.50		3.00	41.67
2 - - - - -	1.50		0.50	50.00
3 - - - - -	0		0	--
4 - - - - -	0		1.00	100.00
5 - - - - -	.25		1.00	75.00
6 - - - - -	.25		1.50	33.33
7 - - - - -	1.25		3.00	33.33
8 - - - - -	0		.50	0
9 - - - - -	0		0	--
10 - - - - -	1.00		3.25	23.08
11 - - - - -	0		.50	0
12 - - - - -	0		0	--
13 - - - - -	0		.50	100.00
14 - - - - -	0		.75	33.33
15 - - - - -	0		.75	66.66
16 - - - - -	1.00		2.75	45.45
17 - - - - -	0		.50	50.00
18 - - - - -	.25		1.75	42.86
19 - - - - -	.50		.25	0
20 - - - - -	.50		4.25	5.88
21 - - - - -	.75		8.75	28.57
22 - - - - -	.25		.25	0
23 - - - - -	.25		1.50	50.00
24 - - - - -	.50		.25	100.00
25 - - - - -	0		1.25	0
Average -	0.35		1.51	33.77

UTAH

The survey in Utah included Box Elder, Salt Lake, Sevier, and Sanpete Counties, which are among the most important and most persistently damaged areas in the State. Damage, even in these counties, last season was slight, but larval populations were sufficiently large in each possibly to produce menacing adult populations.

Box Elder County.-- Adult populations indicate considerable damage in 1937, one-fifth of the fields having menacing populations. B. curculionis cocoons are sufficiently abundant for this parasite to be highly effective next season as usual. The results of the survey in Box Elder County, sampled on October 22-25, are tabulated below.

Field No.	<u>H. postica</u>	<u>B. curculionis cocoons</u>	
	adults	Present	Viabie
	Number	Number	Percent
1 - - - - -	1.25	2.75	9.09
2 - - - - -	4.25	3.25	23.08
3 - - - - -	2.25	15.25	29.51
4 - - - - -	0	13.75	34.55
5 - - - - -	1.00	11.00	22.73
6 - - - - -	1.25	13.75	40.00
7 - - - - -	.50	12.75	33.33
8 - - - - -	0	1.00	75.00
9 - - - - -	0	1.25	20.00
10 - - - - -	0	0	--
11 - - - - -	0	.50	50.00
12 - - - - -	.50	2.25	33.33
13 - - - - -	.75	1.00	75.00
14 - - - - -	.25	4.75	78.95
15 - - - - -	0	0	--
16 - - - - -	1.50	4.00	31.25
17 - - - - -	2.50	12.75	33.33
18 - - - - -	.25	2.75	9.09
19 - - - - -	0	1.50	83.33
20 - - - - -	1.25	11.75	17.21
21 - - - - -	1.25	7.50	20.00
22 - - - - -	1.00	6.75	25.93
23 - - - - -	2.50	2.00	25.00
24 - - - - -	2.00	7.00	14.29
25 - - - - -	1.00	2.50	20.00
Average - :	1.01	5.67	32.77

Salt Lake County. -- Adult populations indicate considerable damage next season, approximately one-fifth of the fields being menaced. B. curculionis cocoons were numerous, indicating the parasite may be expected to be highly effective as usual in 1937. Data obtained in the survey in

Salt Lake County, sampled from October 27 to November 11, are summarized in the following table.

Field No.	<u>H. postica</u>		<u>B. curculionis cocoons</u>	
	adults		Present	Viable
	Number		Number	Percent
1 - - - - -	0.75		5.25	23.81
2 - - - - -	.75		4.50	16.67
3 - - - - -	2.50		5.00	25.00
4 - - - - -	0		8.00	9.38
5 - - - - -	.50		28.50	6.14
6 - - - - -	.75		9.00	11.11
7 - - - - -	0		6.75	40.74
8 - - - - -	1.50		12.25	14.29
9 - - - - -	.25		22.75	4.40
10 - - - - -	3.50		32.50	14.62
11 - - - - -	.50		26.00	19.23
12 - - - - -	1.25		13.75	9.09
13 - - - - -	.75		13.50	7.41
14 - - - - -	.50		4.00	18.75
15 - - - - -	.25		3.25	0
16 - - - - -	.50		4.25	23.53
17 - - - - -	.25		3.25	23.08
18 - - - - -	1.50		23.25	4.30
19 - - - - -	0		9.25	37.84
20 - - - - -	1.00		7.75	22.58
21 - - - - -	.50		9.25	27.03
22 - - - - -	.25		8.25	39.39
23 - - - - -	1.00		11.00	20.45
24 - - - - -	2.25		41.75	17.37
25 - - - - -	2.25		5.50	9.09
Average - -	0.93		12.74	15.31

Sevier-Sanpeto Counties.-- Although sampled separately, these counties are contiguous, identical in most respects, and may be considered as one district. In Sevier County adult populations indicated slight damage next season, approximately one-fifth of the fields being menaced. B. curculionis cocoons were numerous and this species promises to minimize the production of adults in 1937. Results of the survey in Sevier County, sampled on November 5-7, were as follows:

Field No.	<u>H. postica</u>		<u>B. curculionis cocoons</u>	
	adults		Present	Viable
	Number		Number	Percent
1 - - - - -	1.00		8.50	5.88
2 - - - - -	1.25		16.75	8.96
3 - - - - -	2.00		16.50	27.27
4 - - - - -	.25		24.50	30.61
5 - - - - -	.50		3.75	6.67
6 - - - - -	.75		4.25	29.41
7 - - - - -	1.00		11.00	22.73
8 - - - - -	.25		6.25	32.00
9 - - - - -	4.00		8.50	8.82
10 - - - - -	.50		18.75	8.00
11 - - - - -	0		2.00	50.00
12 - - - - -	.75		4.50	16.67
13 - - - - -	.25		.75	33.33
Average - -	0.96		9.69	19.25

In Sanpete County adult populations indicated considerable damage in 1937, one-third of the fields being menaced. Of the total area in the two counties, one-fourth of the fields have menacing weevil populations. In this county B. curculionis cocoons were numerous and the parasite promises to be effective next season, as usual. Results of the survey in Sanpete County, sampled on November 5-7, are shown in the following table.

Field No.	:	<u>H. postica</u> adults	:	<u>B. curculionis</u> cocoons	
				Present	Viabie
	:	<u>Number</u>	:	<u>Number</u>	<u>Percent</u>
1 - - - -	:	4.00	:	12.75	17.65
2 - - - -	:	1.25	:	8.75	0
3 - - - -	:	.75	:	9.75	15.38
4 - - - -	:	3.25	:	6.75	33.33
5 - - - -	:	.75	:	5.25	23.81
6 - - - -	:	3.50	:	15.00	11.67
7 - - - -	:	2.25	:	13.25	13.21
8 - - - -	:	.50	:	11.75	23.40
9 - - - -	:	1.25	:	16.25	32.31
10 - - - -	:	1.00	:	29.00	6.90
11 - - - -	:	.75	:	8.75	8.57
12 - - - -	:	.50	:	21.75	6.90
Average-	:	1.65	:	13.25	14.47

COLORADO

Last season weevil damage in Colorado was confined to Mesa, Delta, and Montrose Counties. In Mesa County 75 percent of the fields were severely damaged, In Delta and Montrose Counties damage was less severe and varied in different districts, one having 14-percent damage and another 90 percent. Consequently, a survey was made last fall in the more important districts of these counties, Mesa County being considered as one district and Delta-Montrose Counties as another.

Delta County.-- Adult populations indicated slight damage next season. No fields sampled had menacing populations but in many fields the numbers present closely approximated that necessary to produce damage.

The results of the survey in Delta County, sampled September 8-18, are as follows:

Field No.	<u>H. postica</u>		<u>B. curculionis cocoons</u>	
	adults		Present	Viable
	Number		Number	Percent
1 - - - - -	1.25	:	4.00	18.75
2 - - - - -	1.50	:	8.50	5.88
3 - - - - -	.75	:	13.00	21.15
4 - - - - -	1.25	:	7.00	53.57
5 - - - - -	1.25	:	3.25	30.77
6 - - - - -	1.25	:	9.00	0
7 - - - - -	.75	:	2.75	18.18
8 - - - - -	1.25	:	4.75	26.32
9 - - - - -	1.50	:	1.00	75.00
10 - - - - -	1.75	:	1.25	0
Average - -	1.25	:	5.45	20.64

Montrose County.-- Adult populations indicated slight damage in 1937. Only two fields actually had menacing adult populations, but in several others the number closely approximated that constituting a menace. The results of the survey in Montrose County, sampled from September 23 to October 8, are tabulated below.

Field No.	<u>H. Postica</u>		<u>B. curculionis cocoons</u>	
	adults		Present	Viable
	Number		Number	Percent
1 - - - - -	1.25	:	2.00	12.50
2 - - - - -	1.25	:	2.25	11.11
3 - - - - -	1.00	:	13.50	11.11
4 - - - - -	4.25	:	2.25	44.44
5 - - - - -	.50	:	.75	66.67
6 - - - - -	1.50	:	6.75	18.52
7 - - - - -	2.00	:	8.25	21.21
8 - - - - -	1.50	:	15.00	25.00
9 - - - - -	1.00	:	12.25	4.08
10 - - - - -	.75	:	5.75	13.04
11 - - - - -	1.00	:	3.00	75.00
12 - - - - -	1.00	:	3.25	7.69
13 - - - - -	1.25	:	4.75	10.53
14 - - - - -	.50	:	11.00	27.27
15 - - - - -	1.00	:	3.50	21.43
Average - -	1.32	:	6.28	19.36

Mesa County.-- Adult populations indicated widespread damage in 1937, menacing populations being present in about three-fourths of the fields. Only 1.5 adults per square foot are necessary to produce damage in this area, owing to poor stands and growth. Last season's studies in western Colorado indicated that the parasite, although rather numerous, was less abundant and less effective than in Utah. Parasitization of early larvae was less and the

effectiveness declined earlier in the season and more rapidly. In view of these findings, the parasite populations are insufficient to be highly effective in western Colorado next season. In the following table the results of this survey are presented. This county was sampled from October 14 to November 23.

Field No.	:	<u>H. postica</u> adults	:	<u>B. curculionis cocoons</u>	
				Present	Viabale
		<u>Number</u>		<u>Number</u>	<u>Percent</u>
1 - - - - -	:	3.75	:	11.50	6.52
2 - - - - -	:	.75	:	2.50	20.00
3 - - - - -	:	2.50	:	10.50	0.
4 - - - - -	:	1.75	:	6.25	40.00
5 - - - - -	:	2.25	:	3.78	6.67
6 - - - - -	:	2.50	:	3.00	33.33
7 - - - - -	:	4.00	:	11.75	40.43
8 - - - - -	:	4.75	:	15.00	5.00
9 - - - - -	:	1.75	:	5.25	33.33
10 - - - - -	:	2.50	:	11.50	41.30
11 - - - - -	:	3.50	:	4.50	27.78
12 - - - - -	:	2.25	:	7.50	33.33
13 - - - - -	:	1.50	:	3.50	7.14
14 - - - - -	:	2.00	:	3.75	6.67
15 - - - - -	:	.75	:	3.25	38.46
16 - - - - -	:	3.00	:	1.50	16.69
17 - - - - -	:	.25	:	1.50	33.33
18 - - - - -	:	.50	:	10.75	25.58
19 - - - - -	:	.50	:	12.75	1.96
20 - - - - -	:	1.00	:	3.25	7.69
21 - - - - -	:	1.75	:	3.50	21.43
22 - - - - -	:	3.00	:	1.50	0
23 - - - - -	:	1.50	:	5.00	45.00
24 - - - - -	:	.75	:	26.00	18.27
25 - - - - -	:	2.75	:	1.50	83.33
Average - -	:	2.06	:	6.83	20.79

NEVADA

Reports of slight damage in western Nevada last season, especially in Washoe and Douglas Counties, prompted a fall survey of this area, including Churchill County. Interest centered on Douglas County where, until last season, the weevil was negligible. Churchill County was considered as a whole district, while the others were considered half-districts.

Douglas County.-- Adult populations indicated slight damage in 1937, one-fourth of the fields having menacing numbers of adults. B. curculionis cocoons were numerous and sufficient to indicate the parasite's effectiveness next season if this county is comparable, as it is believed to be, with

Churchill County, where detailed studies have been made. Results of the survey in Douglas County, sampled on November 20, were as follows:

Field No.	<u>H. postica</u>		<u>B. curculionis cocoons</u>	
	adults		Present	Viable
	Number		Number	Percent
1 - - - - -	0.50		12.50	8.00
2 - - - - -	0		.75	33.33
3 - - - - -	0		1.25	40.00
4 - - - - -	0		24.25	12.37
5 - - - - -	.50		10.75	9.30
6 - - - - -	.50		15.50	17.74
7 - - - - -	7.50		45.25	8.84
8 - - - - -	.50		9.00	27.78
9 - - - - -	2.50		9.00	8.33
10 - - - - -	.50		7.00	21.43
11 - - - - -	0		6.25	28.00
12 - - - - -	2.00		4.25	11.76
Average	1.20		12.15	15.38

Washoe County.-- Adult populations indicated very slight damage in 1937, only one field having a menacing population. B. curculionis cocoons were very numerous, indicating that the parasite will be effective, as usual, next season in minimizing the production of weevils. Results of the survey in this county, sampled on November 21-22, were as follows:

Field No.	<u>H. postica</u>		<u>B. curculionis cocoons</u>	
	adults		Present	Viable
	Number		Number	Percent
1 - - - - -	0.50		33.00	6.58
2 - - - - -	.25		1.50	0
3 - - - - -	0		1.75	14.29
4 - - - - -	.25		21.50	0
5 - - - - -	.50		4.75	21.05
6 - - - - -	3.25		*69.50	3.00
7 - - - - -	1.00		15.75	3.17
8 - - - - -	0		15.00	7.69
9 - - - - -	.25		3.75	40.00
10 - - - - -	.50		8.75	8.57
11 - - - - -	1.00		17.50	10.00
12 - - - - -	.25		23.25	0
Average	0.65		18.42	5.81

*Only 100 dissected of total.

Churchill County.-- Adult populations indicated no damage in 1937, no fields having menacing populations. B. curculionis cocoons were rather numerous and, in view of the small weevil population, the parasite will be effective next season in preventing large weevil populations. The following

table shows the results of the survey in Churchill County, sampled on November 17-19.

Field No.	<i>H. postica</i>		<i>B. curculionis</i> cocoons	
	adults		Present	Viable
	Number		Number	Percent
1 - - - - -	0		5.25	4.76
2 - - - - -	0		10.00	2.50
3 - - - - -	0.75		18.75	1.33
4 - - - - -	0		12.00	4.17
5 - - - - -	0		.75	100.00
6 - - - - -	.25		12.50	4.00
7 - - - - -	0		12.00	22.92
8 - - - - -	0		13.25	11.32
9 - - - - -	.25		19.50	0
10 - - - - -	.25		8.75	5.71
11 - - - - -	.50		9.25	16.22
12 - - - - -	.50		17.75	4.23
13 - - - - -	.50		3.00	8.33
14 - - - - -	0		.50	0
15 - - - - -	0		3.75	0
16 - - - - -	0		11.75	2.13
17 - - - - -	0		1.25	20.00
18 - - - - -	0		17.50	8.57
19 - - - - -	0		4.75	5.26
20 - - - - -	0		1.25	20.00
21 - - - - -	.75		3.75	0
22 - - - - -	0		1.00	0
23 - - - - -	0		21.50	2.33
24 - - - - -	0		4.25	5.88
25 - - - - -	0		10.25	4.88
Average -	0.15		8.97	6.02

NEBRASKA

Sioux County.-- The infestation in western Nebraska first attracted attention in 1934, when slight damage was reported in Sioux County, and since that time a few fields have been damaged annually. In 1936 only one field was severely damaged. Two additional ones showed heavy feeding but, in general, weevils were scarce throughout the county. Ecological studies last season revealed the fundamental trends of the weevil population to be roughly comparable to those existing throughout the older infested areas. A fall survey of 12 fields was consequently made to complete the year's studies. Adult populations indicated virtually no damage next season, only one field having menacing numbers. *B. curculionis* cocoons were scarce and, in view of the low effectiveness of this parasite last season, seemed hardly sufficient to be more effective in 1937. The extremely cold winter, common to this area, may further reduce both parasite and weevil populations.

The results of the survey in Sioux County, sampled on October 27, are tabulated below.

Field No.	:	<u>H. postica</u> adults	:	<u>B. curculionis cocoons</u>	
				Present	Viabie
		<u>Number</u>		<u>Number</u>	<u>Percent</u>
1 - - - - -	:	1.25	:	2.50	30.00
2 - - - - -	:	.75	:	.25	0
3 - - - - -	:	.50	:	.25	0
4 - - - - -	:	0.	:	.25	0
5 - - - - -	:	0.	:	0	--
6 - - - - -	:	.25	:	.25	0
7 - - - - -	:	.25	:	.50	50.00
8 - - - - -	:	0	:	0	--
9 - - - - -	:	.25	:	.25	0
10 - - - - -	:	0	:	0	--
11 - - - - -	:	2.00	:	.50	0
12 - - - - -	:	.25	:	3.50	7.18
Average -	:	0.46	:	0.73	15.15

OUTLOOK FOR WEEVIL DAMAGE IN 1937

Estimates of probable weevil damage next season are based only on those fields actually having menacing adult populations this fall; however, there are fields in each locality that have slightly fewer adults than the number considered menacing and these fields are in a doubtful class. The damage expected next season, therefore, may be more or less extensive than is intimated in this estimate, depending on whether the spring is adverse or favorable for weevil development. Results of the fall survey indicated that widespread, severe damage next season will be limited to Mesa County, in western Colorado, where three-fourths of the fields are menaced. Roughly, one-fourth of the total number of fields surveyed are menaced, and moderate damage is expected in the upper Snake River Valley of eastern Idaho; in Jackson County, southwestern Oregon; in Delta and Montrose Counties, western Colorado; in Douglas County, western Nevada; and in Box Elder, Salt Lake, Sevier, and Sanpete Counties, Utah. Slight or negligible damage is expected in the lower Snake River Valley of western Idaho and eastern Oregon; Eagle Valley, Baker County, Oreg.; Sioux County, Neb.; and Washoe and Churchill Counties, western Nevada. With the exception of western Colorado and southwestern Oregon, the parasite promises to be effective in preventing the production of large weevil populations in 1937. In western Colorado the parasite is rather scarce and, furthermore, its value is doubtful because of its early spring decline in effectiveness. In southwestern Oregon the parasite has only recently been introduced and is not sufficiently abundant to be widely effective as yet, but the results of the recent fall survey reveal that it is rapidly establishing itself.

INSECT PEST SURVEY BULLETIN

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THE MORE IMPORTANT RECORDS FOR MARCH

Reports from Missouri, Oklahoma, and Colorado indicate that grasshoppers passed the winter with very little mortality. Eggs are present in large numbers in practically every county in Missouri. In the Imperial Valley of California Melanoplus mexicanus S.uss. began hatching the third week of March.

Mormon crickets began hatching during the month in Montana, Colorado, and Utah.

A heavy northern flight of the Monarch butterfly was observed in Ventura County, Calif.

Wireworms were reported in destructive numbers in parts of Louisiana, Colorado, and California.

Winter mortality of chinch bugs in Missouri is reported as very low.

The outbreak of the green bug in parts of the Southeast is rapidly terminating. Similar conditions are reported of an outbreak in north-central Oklahoma.

The codling moth is reported as having passed the winter with but little mortality in Georgia and Missouri, whereas in Idaho only 10 percent of the larvae survived the winter in the southwestern part of the State, where temperatures reached 28° below zero late in January.

Winter mortality of the San Jose scale was reported as below normal in Virginia and Georgia. In the Midwest and Pacific Northwest the carry-over was comparatively light.

Although the plum curculio began to emerge earlier than usual in parts of Georgia, the main emergence from hibernation is decidedly behind the blooming of peach trees in that section.

The green citrus aphid is extremely abundant in the main Citrus Belt of southern and central Florida.

The tomato pinworm is reported as having successfully passed the winter out of doors in the vicinity of Kennett Square, Pa. This insect appeared much earlier than usual in Manatee County, Fla. It has also been reported from Duval County, Fla.

Several new infestations of the sweetpotato weevil have been found in Mississippi. It has been possible to trace many of these infestations to the movement of sweetpotato plants.

Reports from the Big Bend of Texas indicate that the pink bollworm passed the winter with very little mortality.

Activity of screwworms is confined principally to the overwintering areas of Florida and southern Georgia and the extreme southern part of Texas.

GENERAL FEEDERS

GRASSHOPPERS (Acrididae)

Missouri. L. Haseman (March 24): Recent limited observations indicate that grasshopper eggs have survived the winter very well and, with 100 of 114 counties carrying rather heavy supplies of eggs, we are expecting much trouble this summer, particularly if it should be dry.

Oklahoma. F. A. Fenton (March 20): Examination was made on March 18 to determine the condition of eggs in an egg bed of Melanoplus differentialis Thos. In the more sunny part of the bed the embryos have developed to the point where the eyes are visible through the shell. Most eggs, however, have not developed this far. All pods examined were in good condition, but there is evidence of considerable destruction of pods by ground-beetle larvae.

Montana. H. B. Mills (March 25): Numerous reports of overwintering grasshoppers, largely Chortophaga viridifasciata Deg., becoming active.

Colorado. S. C. McCampbell (March 8): Grasshopper eggs came through the winter in good condition throughout northeastern Colorado.

California. S. Lockwood (March 27): Grasshoppers are now hatching in considerable numbers in alfalfa fields at Westmoreland, Imperial County. Most of the nymphs of M. mexicanus Sauss. examined were in the first instar, but a few second-instar nymphs were observed. Four or five grasshoppers were collected at each sweep of a standard insect net. This is probably less than half of the hoppers present, as many of them were entangled in the high alfalfa and did not fall into the net.

MORMON CRICKET (Anabrus simplex Hald.)

Montana. H. B. Mills (March 25): Mormon crickets are just beginning to hatch in southern Montana, in Big Horn and Carbon Counties.

Colorado. C. R. Jones (March 26): Mormon crickets are hatching in Moffat County, in northwestern Colorado. Most of this infestation, however, is still under 2 feet of snow.

Utah. C. J. Sorenson (March 22): Mormon crickets began hatching on March 6 in several localities in Millard County, central Utah.

OUTWORMS (Noctuidae)

Missouri. L. Haseman (March 24): Strawberry growers in southwestern Missouri report what seems to be early work of outworms in strawberry fields.

ARMY CUTWORM (Chorizagrotis auxiliaris Grote)

Colorado. S. C. McCambell (March 8): So far reports of the army cutworm from Arapahoe County, near Denver, are not as general as last year, but it is a little early and a large territory has not yet been surveyed.

SOUTHERN ARMYWORM (Frodenia eridania Cram.)

Florida. J. R. Watson (March 22): The semitropical armyworm has been abundant throughout the southern third of the State.

WHITE-LINED SPHINX (Sphinx lineata F.)

California. R. E. Campbell (March 4): An adult of the striped sphinx was seen hovering over narcissus blossoms at Alhambra this evening.

MONARCH BUTTERFLY (Danaus menippe Hbn.)

California. F. H. Wymore (March 20): Thousands of butterflies were observed at the eastern edge of Ventura City, flying north toward the mountains. I had never before seen such large numbers of this species.

WIREWORMS (Elaterridae)

Louisiana. C. O. Eddy (March 24): Wireworms are damaging the eyes of seed sugarcane in several 10- or 12-acre tracts in southern Louisiana.

Colorado. C. R. Jones (March 26): Wireworms are reported from Adams County, northeast of the central part, as damaging wheat and also from Montrose County, on the western border. I do not know whether these are the true or false wireworms, as no specimens were submitted.

California. M. W. Stone (March 3): Male adults of Limonius californicus Mann. were collected on alfalfa near Artesia, Los Angeles County, on February 2, and at Smelzer, Orange County, on February 17. Males began to emerge from laboratory cages on February 16 and females on February 19. Larvae were recovered in large numbers in Orange County on wild barley and malva in bean fields on February 24.

WHITE GRUBS (Phyllophaga spp.)

Maryland. E. N. Cory (March 18): Grubs were observed at Hagerstown, in western Maryland.

Texas. F. L. Thomas (March 9): On March 9, a female P. calceata Lec. was taken at College Station. On March 24, a female P. hirtiventris Horn was taken at a light at College Station. These are the first records for the season.

COMMON RED SPIDER (Tetranychus telarius L.)

Virginia. H. G. Walker (March 24): Red spiders are rather scarce in most of the strawberry fields examined in southeastern Virginia.

Missouri. L. Haseman (March 24): In northwestern Missouri, where for the last 3 years the red spider has been a serious problem, particularly on raspberry, blackberry, and apple trees, our field man, Lee Jenkins, reports that they have passed the winter in much smaller numbers.

Arizona. C. D. Lebert (March 15): Rather severe webbing of T. telarius on many of the Italian cypress and some of the arborvitae in the Phoenix district. Some of the trees were brown and severely webbed.

CEREAL AND FORAGE - CROP INSECTS

WHEAT

HESSIAN FLY (Phytophaga destructor Say)

Missouri. L. Haseman (March 24): With the severe set-back which the wet spring of 1935 gave to the hessian fly in Missouri, the pest did not rebuild its populations seriously during the summer and fall of 1936; however, in northeastern Missouri and in scattered areas throughout the rest of the State some early seeded fields are showing rather serious winter carry-over. The winter mortality seems to have been very light.

CHINCH BUG (Blissus leucopterus Say)

Missouri. L. Haseman (March 24): Winter surveys indicate that the chinch bug infestations in Missouri are spotted, with occasionally abundant carry-over on individual farms. The winter mortality seems to have been low, and the two general areas where hibernating bugs are most abundant are the northwestern and the west-central counties, with a general sprinkling throughout most of the area north of a line from the southwestern corner of the State across to St. Louis.

GREEN BUG (Toxoptera graminum Rond.)

South Carolina. F. Sherman (March 29): Complaints of aphids on small grains have come from all parts of the State. T. graminum and other grain aphids perhaps have been involved. Parasites and predators have helped to check the aphids.

Georgia. T. L. Bissell (March 25): At Experiment (central Georgia) small numbers of aphids are working, but the oats seems to be beyond further injury. Bare patches of dead oats are evident in fields. Since the report a month ago I have heard of injury in Talbot, Jasper, and Franklin Counties.

Oklahoma. F. A. Fenton (March 20): On March 11 a trip was made to the wheat sections of north-central Oklahoma, in Garfield and Kingfisher Counties, and on March 13 to sections of Noble and Payne Counties. The green bug is present in only a few fields and is apparently in about the same condition as it was last January. No further killing of plants has been noticed and the infestation is very spotted. Parasites are also present in a few places. We do not anticipate serious trouble from this pest this year.

ALFALFA

ALFALFA WEEVIL (*Hypera postica* Gyll.)

California. A. E. Michelbacher (March 22): On March 15 the weevil was abundant in a single field in the San Joaquin Valley near Patterson, where an average of 197 larvae and 35 adults were collected in 100 sweeps of an insect net. In other fields examined the larval count was generally less than 30 per 100 sweeps. In the San Francisco Bay district on March 18 the highest average larval count per 100 sweeps was 158. In other fields examined it was below 25. At Pleasanton on March 18 only 3 larvae and 1 adult were collected in 600 sweeps. Adults of *Bathyplectes curculionis* Thoms. were found throughout the infested region. In the San Francisco Bay district a high percentage of the alfalfa weevil larvae were parasitized, while in the most heavily infested field in the San Joaquin Valley a smaller percentage appeared to be parasitized. The weevil population is much lower than a year ago, when counts of 1,000 or more were not uncommon; however, the alfalfa was more advanced than it is this year.

LEAF BEETLES (*Diabrotica* spp.)

Oregon. E. G. Thomson (March 3): *D. soror* Lec. is numerous and damaging young clover in the Willamette Valley.

California. J. Wilcox and M. W. Stone (February 3): The following chrysomelid beetles were taken on alfalfa near Alhambra, Los Angeles County, in their order of importance: *D. soror*, *D. balteata* Lec., *Gastroides cyanea* Melsh., and *D. trivittata* Mann.

S. Lockwood (March 27): The 12-spotted cucumber beetle (*D. duodecimmaculata* F.) is numerous in alfalfa fields in Imperial County, in the southern part of the State.

PEA APHID (*Illinoia pisi* Kalt.)

California. S. Lockwood (March 27): The pea aphid is more than ordinarily numerous in alfalfa at Bard, Imperial County, in the extreme southeastern corner of the State.

Oregon. K. M. Gray and W. D. Edwards (March 3): Eggs are hatching near Astoria, Clatsop County, in northwestern Oregon.

California. J. Wilcox and M. W. Stone (March 16): Pea aphids were much more abundant on alfalfa, at Downey, Los Angeles County, than last month. Syrphid larvae were common.

THREE-CORNERED ALFALFA HOPPER (Stictocephala festina Say)

Louisiana. E. O. Ellisor (March 24): The alfalfa girder (S. festina) has been active and oviposition has continued in southern Louisiana during warm periods throughout the winter. A small percentage of these eggs hatched during warm periods in February and the early part of March; however, the nymphs were killed by cold weather. Large numbers of nymphs hatched from March 17 to 24. A microscopic examination of about 50 alfalfa plants showed that most of the eggs were deposited at least 2 inches above the surface of the soil.

California. S. Lockwood (March 27): The treehopper (S. festina) is common in alfalfa throughout the Imperial Valley but damage is not apparent.

ALFALFA CATERPILLAR (Eurymus eurythema Bdv.)

Idaho. R. W. Haegle (March 19): A heavy infestation of the alfalfa caterpillar was found in a 1936 seeding of alfalfa in southwestern Idaho. The larvae averaged 1/2 inch long and have been feeding since early in March on the green growth that had come through the winter. From early in January until March 1 the field was covered with 6 to 10 inches of snow and the minimum temperature during January was -27° F. at Weiser. The larvae became active as soon as the snow melted early in March. This insect is recorded as spending the winter in the Northern States in the pupal stage and as larvae in the warmer States. The larvae in this instance have lived through the winter.

COWPEAS

COWPEA CURCULIO (Chalcodermus aeneus Boh.)

North Carolina. Z. P. Metcalf (March): Cowpea weevils are generally more abundant on cowpeas than usual.

SUGARCANE

SUGARCANE BORER (Diatraea saccharalis F.)

Louisiana. C. O. Eddy (March 24): Larvae of the sugarcane borer are transforming to pupae rapidly in southern Louisiana. A few moths have emerged. Most larvae and pupae are being found in the tops and in trash; very few in stubble.

FRUIT INSECTS

APPLE

APPLE APHIDS (Aphidae)

Virginia. W. S. Hough (March 18): Aphid eggs are not plentiful in apple orchards at Winchester, northern Virginia. Fall migration to the apple trees was greatly reduced last October and November, and about 10 percent of the winged forms at that time were rosy aphids (Anuraphis roseus Baker).

Missouri. L. Haseman (March 24): There seems to be a scarcity of aphid eggs on fruit trees throughout central Missouri.

Idaho. R. W. Haeghele (March 19): Eggs of the rosy apple aphid (A. roseus) are moderately abundant and starting to hatch in southwestern Idaho. Practically all the eggs seem to have survived the winter in southwestern Idaho, where minimum temperatures in January ranged down to -28° F.

LEAFHOPPERS (Cicadellidae)

Missouri. L. Haseman (March 24): Winter mortality of leafhoppers at Columbia has been rather low, on the average not more than 10 to 20 percent. In northwestern Missouri they show 25 percent mortality in leaves and from 50 to 100 percent mortality in bluegrass.

CODLING MOTH (Carpocapsa pomonella L.)

Georgia. C. H. Alden (March 24): Larvae still in hibernating cocoons at Cornelia, in northeastern Georgia, but there has been no pupation to date.

Missouri. L. Haseman (March 24): Lee Jenkins reports that in northwestern Missouri practically 100 percent of the overwintering worms are alive. In our breeding material at Columbia the winter mortality is very low. In southwestern Missouri the carry-over of worms is heavier than at any other place in the State. Generally overwintering worms are less numerous than they have been any year since the late 1920's; but, with conditions now favoring a fair-to-heavy set of fruit, our growers will be obliged to spray thoroughly to prevent the insect from increasing in numbers in 1937.

Idaho. R. W. Haeghele (March 19): Only 10 percent of the larvae survived the winter in untreated corrugated paper bands on tree trunks in the southwestern part of the State. Where the bands were covered with burlap sacks, 85 percent of the larvae were alive. The lowest temperature reading for the winter was -28° F. on January 21, at Parma, in the southwestern part of the State.

EASTERN TENT CATERPILLAR (Malacosoma americana F.)

North Carolina. W. A. Thomas (March 9): This insect was observed at Chadbourn, where it was just beginning to web in wild cherry leaves just coming out.

Kentucky. W. A. Price (March 26): Several egg masses of the apple tree tent caterpillar have been received from Hodgenville and vicinity. Those received today were hatching.

Arkansas. W. J. Baerg (March 20): Hatching of eggs in northwestern Arkansas was well under way on March 18 and probably began on March 17, or earlier.

Texas. R. K. Fletcher (March 17): Worms nearly grown on plum trees in east-central Texas.

FLATHEADED APPLE TREE BORER (Chrysobothris femorata Oliv.)

Missouri. L. Haseman (March 24): This pest was again very abundant last year and recent observations indicate that it is surviving the winter in large numbers and in healthy condition. On exposed limbs and tree trunks, however, hairy and downy woodpeckers have been very active in feeding on the borers.

ROUNDHEADED APPLE TREE BORER (Saperda candida F.)

Missouri. L. Haseman (March 24): Over the State generally the carry-over of this borer has been less heavy than for the two or three preceding seasons, but some orchard men report rather alarming infestations.

SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

Virginia. W. S. Hough (March 13): Examination of scales in one orchard in northern Virginia, where the infestation is moderately severe, showed that about 60 percent of the individuals were alive, which is somewhat in excess of the usual proportion of live individuals expected at this time of the year. This insect, although present in many orchards, is not as abundant as it was a few years ago, and careful searching is required to locate sufficient numbers to make a count in neglected orchards.

Maryland. E. N. Cory (March 11): San Jose scale observed at Royal Oak.

Georgia. O. I. Snapp (March 22): There has been no mortality of the San Jose scale at Fort Valley from low temperatures during the winter, and the unusually mild winter permitted uninterrupted reproduction, especially in unsprayed orchards. The infestation is now greater than that of an average year, as the percentage of live scale was unusually high at the beginning of the winter. Of 13,200 scales counted under a binocular microscope in November, 95.5 percent were alive. The percentage of live scale in the same orchard in January was 92.9 percent.

Georgia. C. H. Alden (March 24): San Jose scale continues to be abundant on peach and apple trees at Cornelia, in northeastern Georgia, especially in unsprayed or poorly sprayed orchards.

Illinois. W. F. Flint (March 23): There has apparently been no increase in San Jose scale mortality during the past month.

Missouri. L. Haseman (March 24): Observations of San Jose scale in central and northeastern Missouri indicate a rather light carry-over of live scale. In southwestern Missouri there is an increased demand for dormant-spray materials, indicating that considerable spraying will be done before buds open.

Idaho. R. W. Haegele (March 19): Scale counts from several districts in southwestern Idaho showed from 70 to 85 percent winter mortality. Low temperatures in January ranged from -20° to -28° F., for a few hours' duration on only 1 day, which probably accounts for the relatively high survival.

SCURFY SCALE (Chionaspis furfura Fitch)

Virginia. W. S. Hough (March 18): Scurfy scale very abundant in many apple orchards throughout northern Virginia.

EUROPEAN RED MITE (Paratetranychus pilosus C. & F.)

Vermont. H. L. Bailey (March 26): Eggs reported moderately abundant in southern Vermont, with considerable percentage of them dead or parasitized.

Massachusetts. A. I. Bourne (March 12): The red mite was unusually abundant in all orchard sections late in the summer of 1936. Growers find that although there was an unusually heavy deposit of eggs last fall, in many instances many of them have been killed. Apple twigs containing the overwintering cocoons of a small neuropteran, Conventzia hageni Banks, are much more numerous than for many years, and are especially abundant in the orchards where the red mite was very numerous last fall. I do not know whether there is any association between the neuropteran and the red mite.

PEACH

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Georgia. C. I. Snapp (March 19): Plum curculios have not yet appeared in numbers from hibernation at Fort Valley, although full bloom of peach trees is past. They are usually disseminated throughout the orchards by full bloom. Peach trees began to bloom unusually early this year, and with the curculio being held in hibernation later than usual, as compared with the development of the fruit, Georgia peaches may escape an attack by the second brood.

C. H. Alden (March 24): Jarred 20 trees in Elberta peach orchards in northeastern Georgia on March 23 but caught no curculios. Orchard in full bloom.

T. L. Bissell (March 25): We have jarred peach trees and wild plum trees three times a week at Experiment, central Georgia, since March 3, but so far have not taken any curculios.

CUCUMBER BEETLES (Diabrotica spp.)

Georgia. T. L. Bissell (March 25): Beetles, D. duodecimpunctata F., have been common on peach and wild-plum blossoms at Experiment since March 5.

California. S. Lockwood (March 6): The cucumber beetle D. soror Lec. apparently has wintered over in more than normal numbers. They are now easily found in a number of wild plants, particularly in miner's lettuce (Montia perfoliata?). Considerable alarm has been expressed by growers of apricots and early peaches as this beetle was responsible for a considerable loss of tonnage of early peaches and apricots in the Sacramento Valley.

PEACH BORER (Conopia exitiosa Say)

North Carolina. Z. P. Metcalf (March): The peach tree borer has been general throughout North Carolina.

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

South Carolina. F. Sherman (March 29): Adults are being caught in traps at Clemson, in the western part of the State.

BLACK PEACH APHID (Anuraphis persicae-niger Smith)

South Carolina. F. Sherman (March 29): A considerable number of complaints of the black peach aphid have been received. The forms above the ground, as well as those below the surface, were reported.

PEAR

PEAR THRIPS (Taeniothrips inconsequens Uzel)

Oregon. S. C. Jones (March 3-10): Pear thrips were emerging on March 2 in the Umpqua Valley, in southwestern Oregon, and on March 10 in the Willamette Valley.

CHERRY

CHERRY SCALE (Aspidiotus forbesi Johns.)

Virginia. W. S. Hough (March 12): Cherry scale was very abundant in a large sour-cherry orchard near Winchester. This orchard has never been surveyed for scale, although the trees have been bearing fruit for a number of years.

RASPBERRY

RED-NECKED CANE BORER (Agrilus ruficollis F.)

Oklahoma. F. A. Fenton (March 20): Reports have been received of severe damage by the red-necked raspberry cane borer to blackberries, dewberries, and youngberries, all important crops in Oklahoma.

GRAPE

GRAPE LEAFHOPPER (Erythroneura comes Say)

California. C. S. Morley (March 8): Grape leafhoppers are very abundant in Kern County. Vineyards are being plowed and trap crops left for the leafhoppers to hibernate in for the remaining few days of hibernation. The hoppers are very active during the present warm weather.

PECAN

OBSCURE SCALE (Chrysomphalus obscurus Comst.)

Louisiana. C. O. Eddy (March 24): Obscure scale is reported very numerous in northeastern Louisiana.

CITRUS

A LONG-HORNED BORER (Prionus sp.)

Arizona. C. D. Lebert (March 1): The large larvae of P. californicus Mots. or P. heroicus Semen., or both, have been found in several citrus groves northeast of Phoenix. Severe tunneling and, in some cases, complete girdling of the trunks from 3 to 6 inches below the soil level have been observed. There are from one to six larvae per tree.

GREEN CITRUS APHID (Aphis spiraecola Patch)

Florida. J. R. Watson (March 22): The green citrus aphid has been extremely abundant during the last month. The spring flush of growth has been prolonged over an unusually long period this year, affording the citrus aphid a continuous food supply. It is extremely abundant in the main Citrus Belt of central and southern Florida. The Chinese ladybeetle, Leis dimitata quinque-decimpilota Hope, has continued to spread and has now reached Seminole County, in central Florida, and is in Broward County, in the southeastern part of the State.

COTTON APHID (Aphis gossypii Glov.)

Texas. S. W. Clark (March 19): Abundant on limes and certain species of oranges at Weslaco.

PURPLE SCALE (Lepidosaphes beckii Newm.)

Louisiana. C. O. Eddy (March 24): Purple scale is common on citrus in southern Louisiana.

CITRUS RUST MITE (Phyllocoptes oleivorus Ashm.)

Louisiana. C. O. Eddy (March 24): It is reported that the citrus mite is unusually numerous because of the mild winter.

Texas. S. W. Clark (March 15): P. oleivorus is more than usually abundant for this time of year at Weslaco.

A MITE (Anychus clarki McG.)

Texas. S. W. Clark (March 15): Very few specimens of A. clarki observed. This mite is usually abundant at this time of year at Weslaco.

TRUCK - CROP INSECTS

VEGETABLE WEEVIL (Listroderes obliquus Klug)

Florida. J. R. Watson (March 22): Many complaints of the depredations of the vegetable weevil, especially on carrots and beets, have been received from the northern part of the State.

Louisiana. P. K. Harrison (March 24): The vegetable weevil is still generally abundant, injuring turnip, mustard, cabbage, and other plants, in southern Louisiana.

S. S. Sharp (March 24): Vegetable weevil larvae were found feeding on strawberry fruit at Independence, in eastern Louisiana.

SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata F.)

Virginia. H. G. Walker (March 24): The twelve-spotted cucumber beetle has been active on warm days throughout the winter in kale, collard, spinach, rye, and other fields at Norfolk.

SEED CORN MAGGOT (Hylemyia cilicrura Rond.)

Virginia. H. G. Walker (March 24): Adults of the seed corn maggot are rather abundant at Norfolk.

GREEN PEACH APHID (Myzus persicae Sulz.)

Virginia. H. G. Walker (March 24): The spinach aphid is very scarce at Norfolk.

Utah. G. F. Knowlton (March 1): Aphids, M. persicae, were seriously abundant on sugar beets in an experimental greenhouse at Logan.

TOMATO

TOMATO PINWORM (Gnorimoschema lycopersicella Busck)

Pennsylvania. C. A. Thomas (March 22): The tomato pinworm is now restricted in Chester County, southeastern Pennsylvania, to four greenhouse establishments in the vicinity of Kennett Square; however, studies indicate that it survived the mild winter out of doors, hence it may spread rapidly this spring. There was no evidence last spring that it had successfully hibernated out of doors through the severe winter in this vicinity, and all individuals found here last spring undoubtedly came from nearby greenhouses, where they had passed the winter on the growing tomato plants.

Florida. M. D. Leonard (March 17): A letter just received from the County Agent of Manatee County states that the tomato pinworm has appeared much earlier than usual at Bradenton on their big tomato crop. The insect has been found in Dade County from Miami to Homestead.

A CHIRONOMID (Camptocladius sp.)

Pennsylvania. C. A. Thomas (March 22): An unusual injury to recently potted tomato seedlings was found in a greenhouse at Kennett Square, southeastern Pennsylvania, in February. The seedlings fell over on the soil as if "damped off." Examination revealed that each plant had been bored into just below the surface of the soil and then hollowed out by these tiny larvae. The larvae had probably come from the barnyard manure with which the potting soil had been mixed, and after the manure became dry they attacked the tomato plants.

BEANS

POTATO LEAFHOPPER (Empoasca fabae Harr.)

Florida. M. D. Leonard (March 17): During January and February there has been one of the worst infestations of the potato leafhopper on string and lima beans that has occurred in several years in the lower east coast of Florida and along the eastern shore of Lake Okeechobee.

CABBAGE

IMPORTED CABBAGE WORM (Ascia rapae L.)

Virginia. H. G. Walker (March 24): Nearly full-grown imported cabbage worms were observed feeding on collards the middle of January at Norfolk. A few imported cabbage worm butterflies have been observed flying over kale, collard, and cabbage fields during the past week.

North Carolina. W. A. Thomas and F. A. Wright (March 8): Adults of the common cabbage butterfly have been intermittently active in the vicinity of Chadbourn most of the winter, no doubt due to the abnormally high winter temperature.

South Carolina. F. Sherman (March 29): The white cabbage butterfly was in flight as early as February at Clemson, but we have no complaint of damage.

Louisiana. C. E. Smith and R. W. Brubaker (March 24): Adults have been active and ovipositing for 2 weeks, and a considerable sprinkling of larvae, mostly of the first instar, are present on cabbage at this time, at Baton Rouge.

DIAMONDBACK MOTH (Plutella maculipennis Curt.)

Virginia. H. G. Walker (March 24): The larvae of the diamondback moth continued to be quite destructive to kale and collards until about the middle of January at Norfolk; however, all stages of this insect are rather scarce, while its hymenopterous parasite, Angitia hellulae Vier., is rather abundant.

Louisiana. C. E. Smith and R. W. Brubaker (March 24): The larva of the diamondback moth is relatively scarce on the experimental cabbage planting at Baton Rouge.

CABBAGE APHID (Brevicoryne brassicae L.)

Virginia. H. G. Walker (March 24): The cabbage aphid is very scarce at Norfolk.

Texas. S. W. Clark (March 22): B. brassicae is very abundant on late cabbage at Weslaco, in the lower Rio Grande Valley.

Arizona. C. D. Lebert (March 16): The cabbage aphid was extremely abundant on seedling cabbages in frames in the river-bottom area of south Phoenix.

ASPARAGUS

ASPARAGUS BEETLE (Crioceris asparagi L.)

South Carolina. W. C. Nettles (March 29): Injury by the asparagus beetle was observed as early as January in Dorchester County, in eastern South Carolina.

California. J. Wilcox and M. W. Stone (March 18): Several adult beetles were taken from a few scattered new shoots in the field at Downey, Los Angeles County. No eggs or larvae were found.

PEAS

PEA APHID (Illinoia pisi Kalt.)

Georgia. T. L. Bissell (March 25): Colonies of pea aphids becoming thick on terminals of Austrian winter pea. No damage apparent.

Florida. J. R. Watson (March 22): Pea aphids have been rather abundant around Gainesville, Alachua County, in northeastern Florida.

Arizona. C. D. Lebert (March 16): The pea aphid was found on some of the truck farms on the south-side river-bottom area. The pea vines were heavily infested in spots. This pest was not present on earlier peas examined 3 days ago west of Phoenix.

SQUASH

SQUASH BUG (Anasa tristis Deg.)

Utah. G. F. Knowlton (March 16): One adult squash bug was observed to be active at Logan.

ONIONS

ONION THRIPS (Thrips tabaci Lind.)

Florida. J. R. Watson (March 22): Celery in the Sanford, Seminole County, district has been severely attacked by onion thrips.

Louisiana. C. O. Eddy (March 24): T. tabaci is much more numerous now than last year and has increased during the winter.

CARROT

CARROT RUST FLY (Psila rosae F.)

Washington. R. L. Webster (March 20): P. rosae, referred to in the last number of the Pest Survey Bulletin, is represented in A. L. Melander's private collection by two specimens - one taken on May 26, 1908, at Nooksack, a few miles from the Canadian border in Whatcom County; the other on May 17, 1910, at Olga, on one of the islands of Puget Sound.

TURNIP

TURNIP APHID (Rhopalosiphum pseudobrassicae Davis)

Louisiana. P. K. Harrison (March 24): The population of the turnip aphid is increasing on turnip and mustard in the vicinity of Baton Rouge. Parasites of this insect are also becoming more numerous.

LETTUCE

POTATO APHID (Illinoia solanifolii Ashm.)

Georgia. T. L. Bissell (March 19): Aphids abundant on lettuce on one garden, at Griffin, in central Georgia.

STRAWBERRY

STRAWBERRY WEEVIL (Anthonomus signatus Say)

North Carolina. W. A. Thomas and F. A. Wright (February 9): Owing to the unseasonably warm weather of January which caused huckleberries to bloom heavily early in February at Chadbourn, some weevils emerged from hibernation at that time. The cold weather in February caused the weevils to cease emerging and up to March 12 no further emergence had been observed.

STRAWBERRY ROOT APHID (Aphis forbesi Weed)

Virginia. H. G. Walker (March 24): Strawberry root louse eggs were hatching at Norfolk on January 22, about 2 months earlier than eggs hatched last year. The eggs and young aphids were very scarce in every field examined and very little injury is expected.

SWEETPOTATO

SWEETPOTATO WEEVIL (Cylas formicarius F.)

Mississippi. C. Lyle (March 24): During the past few weeks several new infestations of the sweetpotato weevil have been found in southern Mississippi. A considerable number of infested properties have been found in Pike and Jefferson Davis Counties with smaller infestations in Amite, Lawrence, and Jones Counties. The new areas are being placed under quarantine.

PEPPER

PEPPER WEEVIL (Anthonomus eugenii Cano)

Florida. J. R. Watson (March 22): In two or three infestations in Manatee County the pepper weevil has become so abundant as to destroy all peppers and most of the bloom.

SUGAR BEETS

BEET LEAFHOPPER (Eutettix tenellus Baker)

Utah. G. F. Knowlton (March 10): Beet leafhoppers are rather abundant on mustard hosts at Genola and moderately abundant near Lamo, in northern Utah.

TOBACCO

TOBACCO FLEA BEETLE (Epitrix parvula F.)

North Carolina. Z. P. Metcalf (March): The tobacco flea beetle is apparently starting earlier this year than last in eastern North Carolina.

J. U. Gilmore and J. P. Vinzant (March 23): In a 3-day survey of tobacco plant beds in eastern North Carolina only a few beds were found to show serious losses from flea beetle attack. Most of the beds that were well covered with cloth were unaffected. The maximum infestation was 40 beetles per square foot of plant-bed area.

South Carolina. W. A. Shands and N. Allen (March 17): A survey through north-eastern South Carolina showed the flea beetle to be causing economic losses in tobacco plant beds in Florence, Marion, and Horry Counties. The most severe injury was found where the plant beds were poorly constructed or where the canvas did not properly cover them. In one instance of severe injury circumstances indicated that hibernating beetles were carried to a plant bed in pine needles that were used to protect the plants from cold weather.

F. Sherman (March 29): The tobacco flea beetle is seriously abundant in the eastern part of the State.

GREEN JUNE BEETLE (Cotinis nitida L.)

North Carolina. J. U. Gilmore and J. P. Vinzant (March 23): One tobacco plant bed of 130 yards in Pitt County, in eastern North Carolina, had sustained a loss of 50 percent, owing to attack by larvae of the green June beetle. The previous crop was sweetpotatoes that had produced luxuriant growth, providing suitable conditions for June beetle egg deposition.

MUSHROOMS

A MITE (Tarsonemus sp.)

Pennsylvania. C. A. Thomas (March 22): A mite has been very common and destructive to mushrooms and mycelium in mushroom houses in the vicinity of Kennett Square, Chester County, during the past several months, more infestations than usual being reported.

COTTON INSECTS

PINK BOLLWORM (Pectinophora gossypiella Saund.)

Texas. A. J. Chapman (February): An examination of infested cotton bolls in the hibernation experiments at Presidio, in the Big Bend of Texas, indicated that the mortality at the close of February this year (43.75 percent) was about the same as last year (40.80 percent). Examinations made on February 27 in a few fields in which stalks were standing indicated that the winter had caused little mortality.

THURBERIA WEEVIL (Anthonomus grandis thurberiae Pierce)

Arizona. W. A. Stevenson (March 13): At Tucson, in southern Arizona, the first Thurberia weevils from infested cotton bolls that were plowed under and irrigated on February 5, began to emerge last week. This is a few days later than the first emergence of this type of weevils during the last 2 years. Several Thurberia weevils were out of their pupal cells on Thurberia plants on March 11 but, as the plants have not begun to bud, these weevils will undoubtedly die before food is available.

FIELD CRICKET (Gryllus assimilis F.)

Mexico. C. S. Rude (March 23): Crickets are very numerous in the fields at Tlahualilo, in the Laguna. The most common species is G. assimilis. When the cotton begins to come up the species may do considerable damage.

COTTON FLEA HOPPER (Psallus seriatus Reut.)

Texas. F. L. Thomas (March 26): Cotton flea hoppers began hatching in small numbers at College Station, in south-central Texas, on March 18 and were found in the fields shortly afterwards. On warm days, about the 22d, many hatched in the cages.

FOREST AND SHADE - TREE INSECTS

CANKERWORMS (*Geometridae*)

New Jersey. M. D. Leonard (March 21): Cankerworms, mostly Paleacrita vernata Peck, were observed in considerable numbers ascending trunks of oaks and other woodland and shade trees at Ridgewood. The worms were mating freely.

TENT CATERPILLARS (*Malacosoma* spp.)

Vermont. H. L. Bailey (March 26): Egg masses of forest tent caterpillars, (*M. disstria* Hbn.) are abundant in Windham, Windsor, and Rutland Counties, southern Vermont. Scouting records show an average of from 5 to 20 egg masses per tree.

Arizona. C. I. Lebert (March 16): Small webs of *Malacosoma* sp. were observed on cottonwoods north of Phoenix. The trees are scarcely in leaf at this date. A few webs were found on a crab apple tree in this same area. The caterpillars had done no damage.

WHITE-MARKED TUSSOCK MOTH (*Hemerocampa leucostigma* S. & A.)

Illinois. W. F. Flint (March 23): It is practically impossible to find tussock moth eggs anywhere in the northern half of Illinois. This is probably because the severe winter of 1935-36 killed nearly all of the eggs above the snow line.

BOXELDER

A BOXELDER LEAF ROLLER (*Cacoecia negundana* Dyar)

Colorado. S. C. McCampbell (March 16): Eggs of the boxelder leaf roller (*Archips negundana* Dyar) are more abundant than for many years and have come through the winter in viable form in Weld County, north-central Colorado.

C. R. Jones (March 26): In towns in northern Colorado considerable dormant spraying is being done on boxelder and cottonwood trees for control of the boxelder leaf roller.

ELM

EUROPEAN FRUIT LECANIUM (*Lecanium corni* Bouche)

Oklahoma. F. A. Fenton (March 20): The infestation on elms in many localities in the State is serious. Males are emerging and female scales are about one-third developed at Stillwater. One species of parasite has been reared. The percentage of parasitization of scale appears to be quite high.

EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

Colorado. C. R. Jones (March 26): Considerable dormant spraying for control of the European elm scale on elms is being done in northern Colorado towns.

MAPLE

JAPANESE MAPLE SCALE (Leucaspis japonica Ckll.)

New York. E. P. Felt (March 25): The Japanese scale is generally distributed in the village of Freeport, Long Island, though relatively few living insects were to be found on the above date.

PINE

WOOD BORERS (Ips spp.)

Pennsylvania. R. M. Baker (March 24): Pine trees have been severely injured by drought during the past few years. As a result, many inquiries have been received concerning borers, usually Ips spp., which infest these weakened trees. Most plantation owners blame these secondary borers for the death of the trees.

NANTUCKET PINE SHOOT MOTH (Rhyacionia frustrana Comst.).

New York. E. P. Felt (March 25): Specimens of the work of the Nantucket pine moth were received from near Hempstead, Long Island.

SYCAMORE

A CERAMBYCID (Oberea schaumi Lec.)

Mississippi. C. Lyle (March 4): Sycamore twigs infested with Oberea sp., probably O. schaumi, were received from Greenville, northwestern Mississippi, on March 4.

INSECTS AFFECTING GREENHOUSE
AND ORNAMENTAL PLANTS

A LOOPER (Autographa sp.)

Louisiana. C. E. Smith (March 24): The larvae of one or more species of Autographa are present in injurious numbers on snapdragon and calendula in greenhouses and gardens at Baton Rouge.

CAMELLIA

SCALE INSECTS (Coccidae)

Georgia. O. I. Snapp (March 22): Infestations by Fiorinia theae Green, Parlatoria pergandii camelliae Comst., and Lepidosaphes camelliae Hoke, on camellia bushes, mostly Camellia japonica, are unusually heavy at Fort Valley. (Det. H. Morrison.)

Mississippi. C. Lyle (March 24): Scale insects, F. theae, reported from Port Gibson, Centreville, and Laurel, and L. camelliae on Camellia japonica from Centreville, all in the southern part of the State.

HOLLY

A LACEBUG (Tingididae)

North Carolina. Z. P. Metcalf (March): The first report of lacebug on ornamental holly in this State has been received recently.

JUNIPER

JUNIPER WEBWORM (Dichomeris marginellus F.)

Delaware. L. A. Stearns (March 6): Specimens received for identification and request for advice concerning control at Bridgeville, southern Delaware.

PENTSTEMON

CHECKER SPOT (Euphydryas chalcedona Dtlldy. & Hew.)

Arizona. C. D. Lebert (March 8): The larvae of the checker spot, or chalcedon, one of the brush-footed butterflies, was found feeding on bushy pentstemon at the Boyce Thompson S. W. Arboretum at Superior, south-central Arizona. Every bush in the canyon was covered with the caterpillars, which were rapidly defoliating the plants.

INSECTS ATTACKING MAN AND
DOMESTIC ANIMALS
MAN

BEDBUG (Cimex lectularius L.)

North Carolina. Z. P. Metcalf (March): Reported as general in North Carolina.

TROPICAL RAT MITE (Liponyssus bacoti Hirst)

North Carolina. Z. P. Metcalf (March): Reported in Wake and Robeson Counties.

G. B. Lay (March 24): Specimens of the tropical rat mite were collected in a house at Raleigh on February 12. This collection was made following an investigation of the occurrence of three cases of endemic typhus in Raleigh.

SANDBLIES (Culicoides spp.)

Georgia. J. B. Hull (March 24): Notwithstanding the unusually warm weather during the middle of February, no sandflies have been observed biting in the vicinity of Savannah.

Florida. S. E. Shields (February 28): Sandflies have been present in annoying numbers on the island east of Fort Pierce, on the eastern coast. A few complaints have been received from the mainland.

BLACK WIDOW SPIDER (Latrodectus mactans F.)

Maryland. E. M. Cory (March 15): Found in a basement in Salisbury, on the Eastern Shore.

Kentucky. W. A. Price (March 26): A female black widow spider was found at Lexington on March 22.

CATTLE

SCREWORM (Cochliomyia americana C. & P.)

United States. F. E. Dove (April 1): At the end of March screwworms were confined principally to the overwintering areas of Florida and southern Georgia and to that portion of Texas south of U. S. Highway 90, which runs from Orange County, on the east to Del Rio, Val Verde County, on the west. In Florida the low point of the winter was experienced during the last week of December, when 194 cases were reported from the entire State. Since then summer temperatures permitted the pest to build up in dry swamps where wild hogs were infested and when cases occurred in navels of young animals in other areas. In Florida the number of cases reported for December was 1,663; for January, 3,213; for February, 3,573; and from March 1 to 26, 2,930. Cases are now most numerous in navels of young calves and the infestations are rather generally distributed over the peninsular portion of the State, with a

lower incidence in the more northern counties. During January specimens were identified from Georgia as Cochliomyia americana C. & P. from Brooks and Lowndes Counties on the southern border in the central part of the State, and Effingham County, on the Georgia-South Carolina State line. During the third week of February screwworms were again identified from Brooks County. The situation in Florida differs from that of last year in that the low point occurred during the last week in December for last winter and during the third week in February for the preceding winter. At the present time screwworms have a higher incidence and are more evenly distributed in Florida than they were at this time last year. In Texas the situation is somewhat encouraging in that shearing of goats advanced ahead of the spread of the pest so as to prevent a build-up from this source. Cases are present, however, where shearing of sheep is now getting under way and efforts are being made to prevent building up a large population of the pest in such injuries. As yet screwworms have not been found in localities west of Del Rio, Tex., or in any of the other Southwestern States. A few cases were found in the canyons of Uvalde County, but there is yet no evidence that they are present on the Edwards Plateau. At San Antonio one local infestation was apparently stamped out. Counties near the Rio Grande between Del Rio and Brownsville, Tex., show the greatest number of cases for the winter months, as well as for March. For all counties in southern Texas there were reported for December 1,121 cases; for January, 675 cases; for February, 298 cases; and from March 1 to 26, 1,560 cases. During the last week of March 469 cases were reported, as compared to 395 during the preceding week. Stockmen in Texas are screwworm conscious and are preventing a build-up of population of the pest in young animals born during this season.

Texas. E. F. Kripling (March 24): Ranchmen in Hidalgo County, in the southern tip of Texas, report increased activity of the screwworm fly during the last week of February. The most common infestations were in the navels of young calves. Only a few cases were reported during the period from January 1 to the end of February.

A. W. Lindquist (March 24): No infestations of animals were observed in the vicinity of Uvalde from January 16 to February 28. On March 1, two sheep and one calf were found to be infested.

W. L. Barrett (March 24): A survey of the abundance of C. americana along the lower Rio Grande indicates that the flies were more numerous along the Rio Grande from Laredo, in Webb County, to Rio Grande City, in Starr County, during the period from January 15 to February 15. Continuing this survey west to Presidio, from March 8 to 12, no flies or screwworm cases were found west of Del Rio, Val Verde County.

Arizona. C. C. Deonier (March 20): In a survey on March 20, four cases of screwworms were reported from the Arizona-Mexico line, 30 miles west of Nogales, near the central part of the State.

CATTLE GRUBS (Hypoderma spp.)

- Georgia. E. R. McGovern (March 24): An examination on February 5 of 10 cattle showed 6 carrying 75 grubs. Four animals did not show infestation.
- Iowa. R. W. Wells (March 24): An examination of several hundred head of dairy cattle in the vicinity of Des Moines on March 14, showed that none of these animals carried more than 6 or 7 grubs, and less than 10 percent of them were infested.
- Missouri. L. Haseman (March 24): Throughout central Missouri ox warbles generally are less abundant than they have been during past years, although some cows have been showing heavy infestation. Most of the warbles that have not been killed have left the cattle.
- Texas. E. W. Laake (March 24): An examination of 131 dairy cattle in the vicinity of Dallas on March 1-2, showed that 88 animals, or about 67 percent, were or had been infested with cattle grubs. Of the 275 larvae that had infested the 88 cattle, approximately 94 percent had already left the animals.

BUFFALO GNATS (Eusimulium spp.)

- Mississippi. G. H. Bradley (March 24): In northwestern Mississippi buffalo gnats were causing considerable annoyance prior to February 27. An examination of the Yalobusha River showed the presence of large numbers of young larvae, but very few grown larvae and no pupae were found. The onset of cold, rainy weather on February 26 apparently prevented annoyance in the Mississippi Delta during that week, but reports indicate that the pests had been abundant. Examinations of the rivers indicate that the gnats are still in the larval stage, as few pupae or pupal cases were seen on the vegetation and trash in the streams. The rapid fall of the rivers in this section since the flood probably caused the stranding of many larvae in quiet back waters. Reports indicate that little trouble from the gnats had been experienced in Coahoma and Leflore Counties. From March 11 to 14 the gnats were very bad in Tallahatchie County and work stock required repeated treatments with repellents to prevent severe annoyance. Unfavorable weather during the week of March 19 apparently prevented serious annoyance.
- C. Lyle (March 24): Buffalo gnats have been reported at intervals during the past few weeks from several points on the Delta. An unconfirmed report of gnats in Neshoba County in central Mississippi has also been received. The outbreak thus far has not been severe.
- Arkansas. M. W. Muldrow (March 24): It was reported that buffalo gnats made their appearance in eastern Arkansas in January and small numbers were noticed from time to time throughout that month and February. On March 18 they appeared in such numbers as to be extremely troublesome to work stock in a large part of Monroe, Saint Francis, Lee, and Phillips Counties.

HOUSEHOLD AND STORED-PRODUCTS INSECTS

TERMITES (Reticulitermes spp.)

- Pennsylvania. R. M. Baker (March 24): Termites continue to be among the most important insect pests in this State. Requests for information have been increasing.
- Maryland. E. N. Cory (March): Termites were reported from Hagerstown, on March 6, and from Cambridge, on March 15.
- North Carolina. Z. P. Metcalf (March): Termites are more abundant in North Carolina than they were last year.
- Georgia. C. H. Alden (March 24): Several swarms of flying termites were noted during the past 2 weeks at Cornelia, in northeastern Georgia.
- Kentucky. W. A. Price (March 26): Observed swarming at Lexington on February 28.
- Illinois. W. P. Flint (March 23): Swarms have been reported from a few houses during the last month.
- Oklahoma. F. A. Fenton (March 20): Termites reported swarming at Ripley, Payne County, in the north-central part of the State.
- Texas. F. L. Thomas (March 26): Termites reported in Starr County, southern Texas.

ANTS (Formicidae)

- Texas. S. W. Clark (March 15): Scattered infestations of Solenopsis geminata F. on young citrus trees in Hidalgo County, southern Texas.
- F. L. Thomas (March 26): Cut ants have been reported as injurious in gardens and to trees and shrubs in Aransas and Travis Counties.

PAINTED HICKORY BORER (Cyllene caryae Gahan)

- Ohio. J. N. Knull (March 20): Numerous complaints of adults in homes have come from various places in Ohio, where they were emerging from hickory firewood in basements.

CARPET BEETLE (Anthrenus scrophulariae L.)

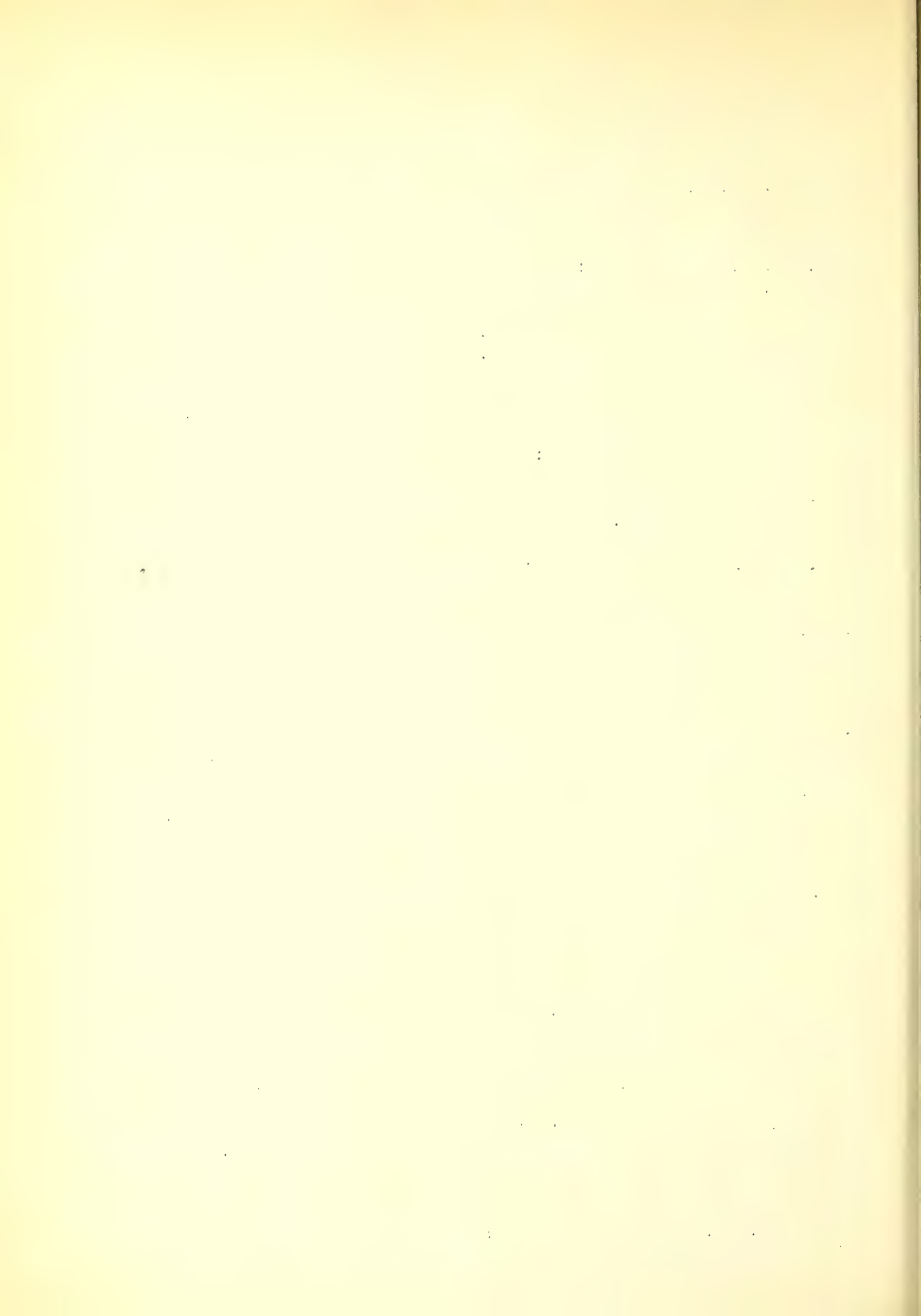
- Montana. H. B. Mills (March 25): Requests for information on the control of carpet beetles have been received.

LESSER GRAIN BORER (Rhizopertha dominica F.)

- Kentucky. W. A. Price (March 26): Large numbers of the lesser grain borer were found in the screenings of wheat at a Lexington mill.

RICE WEEVIL (Sitophilus oryzae L.)

- South Carolina. F. Sherman (March 29): One very heavy infestation of the rice weevil on stored corn was recently observed in Aiken County.



THE MORE IMPORTANT RECORDS FOR APRIL

From northern Indiana and Illinois westward to Montana and Oklahoma grasshopper eggs appear to have passed the winter in good condition, with prospects of moderate-to-heavy infestation over limited areas in many parts of the territory. The first records of hatching were made in Montana on April 21 and in Utah on April 17.

Mormon crickets were hatching during the second and third weeks in April in Montana, Colorado, Idaho, Utah, and Nevada.

Wireworms were reported as doing some damage in Idaho and southeastern Washington.

During the second week in the month first flights of May beetles occurred in Louisiana, Mississippi, Oklahoma, and Texas. Adults were also recorded later in the month from Iowa and Kansas.

The usual spring records on cutworm activity are being received from Florida to Michigan and westward to Missouri and Kansas. Reports have also been received from the Great Basin and the Pacific coast. In California considerable damage to tomatoes was reported from the southern part of the State.

In general, hessian fly infestation is very low.

Cold, wet weather held the chinch bug in hibernation in the East Central States. These insects are quite prevalent from Ohio to Nebraska, and southward to Kansas.

Severe damage to winter wheat by false wireworms was reported from western Nebraska and Kansas.

Rather heavy infestations of wheat by mites were reported from Kansas and Oklahoma. In the latter State considerable injury was observed.

The pea aphid is considerably more abundant on alfalfa and peas in the Norfolk section of Virginia than usual. It was also reported from Louisiana, Kansas, and Utah.

Thus far, reports from Mississippi to Virginia and westward to Wisconsin indicate that aphids are comparatively scarce on deciduous fruit trees.

The first record of collecting adult codling moth was made in Georgia on April 16. In the East Central States the insect appears to have passed the winter in good condition and in large numbers.

Tent caterpillar abundance was generally reported along the Atlantic coast from New Hampshire to Florida. The larvae were practically full grown in Florida by the middle of March, whereas in New Hampshire eggs were first observed hatching on April 19.

Serious damage by the flatheaded apple tree borer was reported from Nebraska, Kansas, and Oklahoma, probably a result of the drought of recent years.

The mild winter was reflected in heavy survival of the San Jose scale.

The heavy infestation of the green citrus aphid in Florida, reported in the last number of the Survey Bulletin, was brought under almost complete control by a period of heavy rains during the first part of the month, which encouraged a rapid development of a fungous disease.

The tomato pinworm was unusually abundant in southern California.

During the last week in the month Mexican bean beetles were observed in the field in the Norfolk section of Virginia. During about the same period they were reported from Alabama and Mississippi.

Damage to beans by the bean leaf beetle was reported from Georgia to Louisiana and up the Atlantic coast to Virginia.

A light infestation of pepper weevil was found in Sarasota County, Fla. This is the first infestation in the State outside of Manatee County.

The tobacco flea beetle was more destructive than usual in the Carolinas. It was also reported in small numbers from Florida and Tennessee.

In the eastern part of the Cotton Belt, although boll weevils apparently passed the winter successfully, the small numbers that went into hibernation indicate light early infestation. In the southern part of Texas, on the other hand, owing to the fact that the cotton remained green throughout the winter, the insect will probably be more abundant than usual.

Present indications are that the cotton flea hopper will be more abundant than usual in parts of Texas. The spring emergence is higher than in any previous year.

GENERAL FEEDERS

GRASSHOPPERS (Acrididae)

- Indiana. J. J. Davis (April 26): There is every evidence of grasshopper abundance in the western tiers of counties and in northern Indiana, with scattered outbreaks more or less general in the northern half of the State.
- Illinois. W. P. Flint (April 26): The weather has been very cool and wet during the month of April. Grasshopper eggs brought into the laboratory are now hatching in about 12 days after being brought in. No hatch outside has been observed.
- Missouri. L. Haseman (April 27): Grasshopper eggs are coming through the winter in good shape, with perhaps not over 5-percent mortality of eggs. With a statewide abundance of eggs, as shown by winter surveys, there are prospects of a heavy hatch of young hoppers throughout the State during May.
- Nebraska. M. H. Swenk (April 22): Grasshoppers of various fall-hatching species were reported present in alfalfa and other fields during March and April; however, no Melanopli had hatched up to April 20.
- Kansas. H. R. Bryson (April): E. G. Kelly reports that grasshopper eggs were abundant in alfalfa and clover fields in southeastern Kansas on April 17. Hoppers recently hatched were observed at Manhattan on April 19. Eggs are abundant in experimental plots at Manhattan.
- Oklahoma. F. A. Fenton (April 17): A recent trip was made in the north-central part of the State with R. E. Shotwell. Eggs of Melanoplus differentialis Thos. were found to be in good condition, and Mr. Shotwell estimated the date of hatching as approximately the middle of May.
- Montana. H. B. Mills (April 22): First reports of grasshoppers hatching were from Powder River County in southeastern Montana on April 21.
- Utah. G. F. Knowlton (April 17): Melanoplus sp. is just beginning to hatch on warm south slopes at Genola, Utah County. A late season has delayed grasshopper hatching. Nymphs of Haldeman's locust (Hippiscus corallipes Hald.) are about half-grown, in the same county.

MORMON CRICKET (Anabrus simplex Hald.)

- Montana. H. B. Mills (April 22): Mormon crickets began hatching in Yellowstone and Big Horn Counties in south-central Montana and in Lake County in west-central Montana about April 12, and they are now largely hatched in the lower areas.

Colorado. C. R. Jones (April 23): The County Agent in Moffat County informs us that the Mormon cricket on the Western Slope is hatching profusely.

Idaho. C. Wakeland (April 19): In north-central Idaho Mormon crickets began hatching in Idaho County about March 15, in southwestern Idaho in Ada County about March 25, in Elmore County about April 1, and in Washington County about April 5. These are the earliest counties in the State infested with Mormon crickets. Continued rainy, snowy, cold weather is delaying activities of these insects.

Utah. C. J. Sorenson (April 26): Mormon crickets now in third and fourth instars menacing farm crops in Juab, Millard, and Tooele Counties, central Utah. Crickets are already much more numerous than in 1936. Hatching has not yet taken place on high mountainous elevations where many eggs were deposited and where many are still covered by snow.

Nevada. G. G. Schweis (April 21): A member of this department made an investigation of the Mormon cricket in eastern Nevada during the last few days and reports great numbers of crickets throughout the area.

WIREWORMS (Limonius spp.)

Idaho. R. W. Haegele (April 19): Adults of wireworms, L. californicus Mann., are emerging and large numbers were occasionally observed at Parma, southwestern Idaho.

Washington. E. W. Jones (April 19): The Pacific Coast wireworm (L. canus Lec.), the sugar beet wireworm (L. californicus), and the western field wireworm (L. infuscatus Mots), were attacking young onion and carrot plants generally during April at Walla Walla, in southeastern Washington.

MAY BEETLES (Phyllophaga spp.)

Mississippi. J. Milton (April 24): May beetles are injuring roses and young pecan trees in Jackson.

E. W. Dunnam (April 18): On April 16 the first beetle observed this season was at a light in Leland and on April 18 two more were noted.

Louisiana. H. L. Dozier (April 23): The first spring flight took place on March 20 near Sunset, where the beetles were fairly abundant during several nights. They were very abundant there on April 23. The beetles were observed in vast numbers at lights at Opelousas on April 10-12.

Iowa. H. E. Jacques (April 22): May beetles are being taken at lights and in soil activities, but have not yet shown up in large numbers.

Kansas. H. R. Bryson (April 22): White grubs are moderately abundant at Manhattan this spring. Adults have not been taken at light but are near the surface of the soil ready to fly when the soil becomes warmer.

Oklahoma. F. A. Fenton (April 14): The first activities of June beetles were reported on April 14.

Texas. F. L. Thomas (April 26): The following records were made on species active since April 18: P. calceata Lec., P. hirtiventris Horn, P. rubiginosa Lec., P. crassissima Blanch., abundant at College Station, Brazos County; P. praetermissa Horn, P. tristis F., P. congrua Lec., active but not abundant at College Station; P. calceata, P. micans Knoch, P. crassissima, P. arkansana Schiff., abundant in Smith County; P. prunina Lec., P. profunda Blanch., P. bipartita Horn, P. praetermissa, P. tristis, active but not abundant in Smith County; and P. subacida Lec., active on April 26 in Zavalla County at Crystal City.

GREEN JUNE BEETLE (Cotinis nitida L.)

Kentucky. M. L. Didlake (April 23): Green June beetle larvae excessively abundant in pasture and potato field near Louisville.

Tennessee. L. B. Scott (April 5): Reports from Sumner, Smith, and Davidson Counties in north-central Tennessee indicate severe damage in tobacco plant beds by green June beetle.

CUTWORMS (Noctuidae)

Florida. F. S. Chamberlin (April 23): The warm, wet weather in January favored the growth of green vegetation on tobacco land at Quincy, Gadsden County. For this reason, it was probable that cutworm infestation on newly set tobacco plants this spring would be heavier than usual. Observations made during the latter part of April indicate, however, that the infestations are only slightly greater than normal.

Indiana. J. J. Davis (April 26): Climbing cutworms are beginning to show some activity in the northern end of the State, where they have been quite destructive in recent years. Observations indicate that they are less abundant than last year, but still sufficiently numerous to require active control in orchards.

Michigan. R. Hutson (April 22): Cutworm activity became noticeable early. Reports of injury to fruit trees have been received from Berrien County.

Tennessee. L. B. Scott (April 14): Cutworms, probably of Feltia ducens Walk., are abundant in timothy and bluegrass pastures at Clarksville, Montgomery County.

Alabama. J. M. Robinson (April 22): Cutworms are active in gardens at Auburn, particularly where tomato plants have been transplanted.

- Missouri. L. Haseman (April 27): Early indications are that cutworm populations in central Missouri will probably be below normal, though in the last week they have been showing up in greater numbers. Practically no gardening work has been done.
- Kansas. H. R. Bryson (April 20): R. C. Smith and R. H. Painter found a large number of dingy cutworms (F. subgothica Haw.) in alfalfa and wheat fields, but they were not doing any damage.
- Utah. C. J. Sorenson (April 25): Pale western cutworm (Parosagrotis orthogonia Morr.) causing slight injury in dry-farm grain in the north-western part of Utah County and on the Levan ridge in Juab County.
- Washington. R. S. Lehman (April 19): Chorizagrotis agrestis Grote, has been doing considerable damage to cabbage plants in southeastern Washington; The plants are greenhouse-grown and were set out this spring.
- California. J. Wilcox (April 14): From one to four cutworms were found per tomato plant in fields examined in Orange County. They were doing considerable damage to leaves and blossoms. Species determined by S. E. Crumb as F. annexa Treit. and Lycophotia margaritosa saucia Hbn.

FALL ARMYWORM (Laphygma frugiperda S. & A.)

- Louisiana. L. O. Ellisor (April): A serious outbreak of the fall armyworm on oats occurred in northern Louisiana during the last 2 weeks. They are heavily parasitized and their numbers are being reduced rapidly.
- C. L. Stracener (April): An outbreak of the fall armyworm, or grass worm, occurred on sugarcane in southern Louisiana, but the larvae were heavily parasitized and are not expected to do much damage.

WHITE-LINED SPHINX (Sphinx lineata F.)

- California. S. Lockwood (April 20): An outbreak of the white-lined sphinx has been reported to this office from Riverside County. Apparently it is destroying native vegetation in and around Palm Springs, Riverside County.

PAINTED LADY (Cynthia cardui L.)

- Vermont. H. L. Bailey (April 27): A specimen of the painted lady butterfly was noted at Montpelier, central Vermont, on April 10.

MOURNING-CLOAK BUTTERFLY (Hamadryas antiopa L.)

- Ohio. J. S. Houser (April 5): An adult was observed flying in a woodland in Moorland, Wayne County, in north-central Ohio.
- Utah. G. F. Knowlton (April 14): Mourning-cloak butterflies have been observed in flight for the last 3 weeks, whenever the weather was warm.

CEREAL AND FORAGE - CROP INSECTS

WHEAT AND OTHER SMALL GRAINS

HESSIAN FLY (Phytophaga destructor Say)

Ohio. T. H. Parks (April 24): The hessian fly infestation is very low and no visible damage is expected in any part of the State.

Indiana. W. B. Noble (April 19): Spring emergence of the hessian fly is late. A dissection of overwintered puparia from volunteer wheat at Lafayette showed 55 percent to contain white to pink pupae. Very few eggs present on young wheat. (April 23): A dissection by H. R. Painter showed 63 percent of puparia from volunteer wheat near Lafayette to contain white to red pupae. About 3 percent showed emergence of adults.

Illinois. C. Benton (April 15): White to red pupae present in volunteer wheat in Christian County, central Illinois.

Missouri. L. Haseman (April 27): Except for a few areas, the hessian fly is not particularly alarming this spring. The worst center, according to our observations, is on the east side of the State, particularly in the northeast part, where some heavily infested fields have been found.

Kansas. H. R. Bryson (April 22): Wheat fields in the western part of the State are practically free of infestation. In one field near Junction City adults were laying eggs.

CHINCH BUG. (Blissus leucopterus Say)

Ohio. T. H. Parks (April 24): A survey made in eight counties from April 20 to 23 showed chinch bugs abundant in clumps of volunteer timothy in many localities. The heaviest infestation was found in Wyandot County, north-central Ohio, though this may not be the center of the infestation. Counts revealed from none to 206 overwintering bugs per square foot of timothy clump, depending on the locations visited. The average number per square foot for 43 examinations is 25 bugs. This is 12 times as many as were found in a similar survey during the spring of 1936. Dry weather will undoubtedly bring trouble.

Indiana. J. J. Davis (April 26): Chinch bug abundance is anticipated along the western border of the State from Lake County to Greene County and extending into the interior for at least two tiers of counties.

Illinois. C. Benton (April 17): The weather has been cold, except during the past few days, when maximums have reached 76-83° F. Observations near Taylorville, Christian County, in central Illinois, on these days showed the bugs to be restless and numbers moving around among the bunch-grass clumps, but most of them still rather inactively hiding in the clumps. There may have been some migration on these days, notwithstanding the rather stiff wind prevailing, although casual observations in small grains have shown no bugs yet.

W. P. Flint (April 22): The cold, wet weather has held the chinch bugs in hibernation. A very few flew out on April 22, but the number leaving winter quarters was very small.

Missouri. L. Haseman (April 27): In some areas the winter mortality of chinch bugs seems rather high, but generally the carry-over has been about normal. Only in three or four restricted areas does the pest appear to be especially alarming, though normal or perhaps above-normal carry-over has been observed throughout most of the farming counties of the State. West-central, northwest, and north-central areas include some localities with alarming carry-over.

Nebraska. M. H. Swenk (April 22): A survey of the winter survival of the chinch bug in the center of the more heavily infested area in south-eastern Nebraska, including Otoe, Nemaha, and Johnson Counties, during the latter part of March showed that slightly more than 80 percent of the bugs wintering in the bluestem bunch grasses had survived. Other infested counties include Richardson, Pawnee, Gage, Lancaster, Cass, and Sarpy.

Kansas. H. R. Bryson (April 17): A considerable number of chinch bugs overwintered successfully at Manhattan during the last winter. They are late coming out of winter quarters. E. G. Kelly reports that they were not out of hibernation in the southeastern Kansas counties on April 10.

Oklahoma. F. A. Fenton (April 17): An examination of the fields in Payne County, north-central Oklahoma, shows the chinch bug to be present only in small numbers and not sufficient to cause trouble this season. The averages per square foot for the last 2 years are as follows: 1936--Sorghum 2, grass 14; 1937--sorghum 13.8, grass 14.8.

GRAIN APHIDS (Aphididae)

North Carolina. Z. P. Metcalf (April 14): The green bug (Toxoptera graminum Rond.) is more abundant on oats and other small grains, in the Upper Piedmont and mountain counties than for the past 10 years. The pest has been determined as the green bug, although several other species are undoubtedly involved.

Maryland. E. M. Cory (April 23): Grain aphids, probably Macrosiphum granarium Kby., attacking wheat on the Eastern Shore in Trappe, Talbot County, and Ridgely, Caroline County. No specimens received.

Kansas. H. R. Bryson (April 17): No reports or observations on infestations of the green bug have been noted by E. G. Kelly, extension entomologist. Samples of wheat brought in for examination for mite injury contained a few green bugs.

Oklahoma. F. A. Fenton (April 17): An incipient outbreak of the green bug developed in the southwestern part of the State in Caddo, Kiowa, Comanche, Tillman, and Cotton Counties. Fields were visited on March 31 and on April 1 and 2, and numerous dead sorts in many fields were found due to the activities of this pest. In some cases there has been no apparent

increase from last winter, and in others the infestation was light. In all cases the insects were breeding in both volunteer and drill wheat. The parasite Lysiphlebus testaceipes Cress. is present. A second trip to the infested section was made on April 10 and the insect had completely disappeared from most of the fields.

Colorado. C. R. Jones (April 23): Reports have been received that the grain aphid is prevalent in the wheat fields in Las Animas County, near Mookina. A few fields of winter wheat show a damage of about 25 percent; however, considerable numbers of ladybird beetles are now working on the grain aphid.

SAY'S PLANT BUG (Chlorochroa sayi Stal)

California. C. S. Morley (April 2): Say's plant bugs were found in heads of barley in Kern County at the rate of one to five bugs per five sweeps of the net. They were most numerous at the edges of fields planted to cotton last year.

SAWFLIES (Tenthredinidae)

Pennsylvania. E. J. Udine: As the wheat stem sawfly (Cephus pygmaeus L.) has spread into eastern Pennsylvania, it has gradually driven out the black grain stem sawfly, Trachelus tabidus F., which has been established for many years in that part of the country. The history of its spread shows that in 1919 it was confined to New York State, while T. tabidus occurred abundantly in Pennsylvania. By 1925 a mixture of the two species was found in certain sections of Pennsylvania along the Susquehanna Valley, with a preponderance of T. tabidus in evidence. By 1927 parts of the Susquehanna Valley in Pennsylvania showed an even abundance of both species, and by 1936 most of the eastern Pennsylvania and parts of the Susquehanna Valley region were infested preponderantly by C. pygmaeus, with the other species rarely showing up. T. tabidus, on the other hand, has been steadily advancing to the south and west, where no wheat sawflies originally occurred, and was found last year for the first time in Pittsylvania County in southern Virginia.

Kansas. H. R. Bryson (April 22): R. H. Painter and R. C. Smith found sawfly larvae plentiful on wheat. Larvae are leaf feeders but were doing apparent injury to wheat.

FALSE WIREWORMS (Eleodes spp.)

Nebraska. M. H. Swenk (April 22): Reports of severe damage to winter wheat by the plains false wireworm (E. opaca Say) were received in April from Saline, Sherman, Kearney, and Furnas Counties. One report from eastern Furnas County stated that in some fields 90 percent of the wheat plants had been killed during the winter and spring. Another report from the southern part of the county indicated that in some fields 70 percent of the wheat had been killed. The Saline County correspondent wrote that these false wireworms were very numerous about the roots of winter wheat in two fields. In Sherman County the pest was abundant during the fall, winter, and spring in cornfields around Ansley.

Kansas. H. R. Bryson (April 20): False wireworms (Eleodes spp.) were quite numerous in western Kansas last fall and are still present in considerable numbers. Very little damage was done to planted wheat, owing to the fact that sufficient soil moisture was present to insure rapid germination. One report was received from Atwood, indicating that larvae had done some injury to the underground part of the wheat stems.

CLOVER MITE (Bryobia praetiosa Koch)

Oklahoma. F. A. Fenton (April 17): A new pest, which has caused considerable injury in many wheat fields, is developing. This has been tentatively identified as the brown mite (B. praetiosa). It was first seen in the southwestern part of the State but has been reported recently from Enid to Stillwater, in the north-central part of the State.

A MITE (Petrobia tritici Ewing)

Kansas. H. R. Bryson (April 22): R. H. Painter and R. C. Smith found a mite, probably P. tritici, in four fields in central Kansas in the vicinity of Ellsworth, McPherson, and Lindsborg, but it was not causing the damage reported. Dry weather was responsible for most of the injury observed. Mites were abundant in only one field.

CORN

EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

Virginia. H. G. Walker and L. D. Anderson (April 27): Pupae were found at Norfolk on April 8. Several of the pupae were getting quite dark in color, as though they had been in the pupal stage for several days.

ALFALFA

ALFALFA WEEVIL (Hypera postica Gyll.)

Utah. G. F. Knowlton (April 14): Alfalfa weevils have been picked up on a number of occasions this spring, in berry patches many rods from the nearest alfalfa field.

California. A. E. Michelbacher (April 21): The harvest of the first crop of alfalfa in middle lowland California is nearly completed. In not a single case did the alfalfa weevil cause any economic injury. In one field near Patterson, in the San Joaquin Valley, the larval count reached about 2,000 individuals per 100 sweeps of an insect net before the field was cut. In the rest of the infested area highest average collections per 100 sweeps of a net failed to reach 500. In many fields the count was less than 100. Parasitization by Bathyplectes curculionis Thoms. has continued heavy. In the San Francisco Bay area it has remained close to 95 percent. On the 29th of March in the heavily infested field near Patterson only 34.5 percent of the larvae were parasitized, while in other fields in the San Joaquin Valley parasitization ranged from 70 to 80 percent.

PEA APHID (Illinoia pisi Klth.)

- Virginia. L. W. Brannon (April 27): I have just made 100 sweepings in alfalfa on the experiment station farm and collected approximately 1/2 pint of aphids, which I estimate at 50,000 or more. Sweepings made in this same field on April 30, 1936, resulted in an estimated collection of 15,800 aphids per 100 sweepings. Sweepings were also made on peas growing on the city farm nearby. Approximately 1,000 aphids were collected per 100 sweeps. On April 30, 1936, sweepings made in a field of peas on this same farm, resulted in the collection of 35 aphids per 150 sweeps. The peas on this farm, on which the sweepings were made, appear to be in full bloom now. In view of these findings, it appears that the pea aphid is considerably more abundant in the Norfolk area than at this time last year.
- Louisiana. C. O. Eddy (April): The pea aphid has been numerous a number of times but has not been consistently injurious.
- Kansas. H. R. Bryson (April 20): R. C. Smith found pea aphids in every alfalfa field examined from Manhattan westward to the central part of the State.
- Utah. G. F. Knowlton (April 20): Pea aphids have been hatching in small numbers in Utah and Salt Lake Counties. The spring has been unusually late, retarding development. At Hyde Park pea aphids have hatched out, and are rather abundant on sweet clover. Most of those examined were in the second and third instars. They are less abundant upon alfalfa.

CLOVER

CLOVER LEAF WEEVIL (Hypera punctata F.)

- Kentucky. M. L. Didlake (April 23): Clover leaf weevil larvae are numerous in red clover, also in tobacco plant beds, and are injuring lettuce and cabbage at Owenton and Carlisle.
- Kansas. H. R. Bryson (April 20): R. C. Smith reports the clover leaf weevil numerous at Manhattan. He found no weevils in the alfalfa fields examined en route in a recent trip to the central part of the State.

CLOVER STEM BORER (Languria mozardi Letr.)

- Iowa. H. E. Jacques (April 22): The clover stem borer seems to be more than ordinarily abundant.

VETCH

VETCH WEEVIL (Bruchus brachialis Fahraeus)

- North Carolina. J. S. Pinckney (April 17): The vetch weevil is now leaving its hibernation quarters and entering the vetch fields at Salisbury, Rowan County, west of the central part.

SUGARCANE

SUGARCANE BORER (Diatraea saccharalis F.)

- Louisiana. C. O. Eddy (April): The sugarcane borer is transforming to adults rapidly and is laying eggs abundantly in south Louisiana.

FRUIT INSECTS

APPLE

APPLE APHIDS (Aphididae)

Massachusetts. A. I. Bourne (April 26): Orchard plant lice are normally abundant, as evidenced by overwintering eggs. We found the first hatching at Amherst on April 16.

Connecticut. P. Garman (April 20): Aphis pomi Deg. and Anuraphis roseus Baker are less abundant than last year in New Haven County. Lady-beetles emerging in considerable numbers from hibernation.

New York. N. Y. State Coll. Agr. News Letter (April): The rosy apple aphid was hatching generally in the Hudson River Valley the last week of the month. A few grain aphids (Rhopalosiphum prunifoliae Fitch) and green aphids were also observed. In western New York a very few specimens of the grain and green species had been observed by the last of the month. The only report of the rosy aphid was made from Ithaca, where a single specimen was taken on April 26.

Pennsylvania. J. O. Pepper (April 26): Infestations of rosy apple aphid are scattered in eastern Pennsylvania apple orchards.

New Jersey. E. Kostal (April 22): Rosy apple aphid infestation light on apple trees at Morganville, Monmouth County, where the trees are in pre-pink stage.

Virginia. A. M. Woodside (March 30): Apple aphids began hatching in Augusta County (central valley region of Virginia) about March 30. Rosy aphid rare.

W. S. Hough (April 24): Apple aphids not numerous. Little or no commercial damage expected around Winchester, in northern Virginia, from rosy aphid.

Indiana. J. J. Davis (April 26): Apple aphids are scarce in southern Indiana, according to G. E. Marshall.

Wisconsin. C. L. Fluke (April 20): Eggs of the common species of fruit aphids not abundant, suggesting a very light early infestation in southwestern Wisconsin.

Missouri. L. Haseman (April 27): The different species of plant lice on fruit trees seem to be less abundant this spring than normally. Only one or two reports have been received.

CODLING MOTH (Carpocapsa pomonella L.)

Georgia. C. H. Alden (April 21): First codling moth caught in the bait traps at Cornelia, northeastern Georgia, on April 16, about the same time as in 1936. Caught 42 moths in 12 traps on April 19.

Ohio. T. H. Parks (April 24): Examination of overwintering cocoons indicates a high winter survival. Birds have destroyed many, making it difficult to collect larvae from tree trunks.

Indiana. L. F. Steiner (April 20): The first pupation was noted by S. A. Summerland on April 6 at Elberfeld (extreme southwestern Indiana). On April 20 approximately 25 percent had pupated, as compared to 50 percent on April 16, 1936. At Bicknell (50 miles north of Elberfeld) only 4 percent had pupated on April 16. The current population is well above normal. Winter mortality was very low and a heavy flight of the spring brood is anticipated.

J. J. Davis (April 26): The codling moth is overwintering in greater numbers than usual. G. E. Marshall reports that 3 percent of the worms under bands had pupated by April 22 at Orleans.

Illinois. W. P. Flint (April 19): Codling moth pupation was general in southern Illinois during the week beginning April 19.

Missouri. L. Haseman (April 27): For the past week codling moths have been pupating in the southern part of the State and are expected to begin emerging any day here in central and northern Missouri. The last 5 or 6 cold, rainy days and nights have again slowed down moth development, as well as fruit development.

Kansas. H. R. Bryson (April 22): R. L. Parker reports a normal carry-over of codling moth in northeastern Kansas.

EASTERN TENT CATERPILLAR (Melacosoma americana F.)

New Hampshire. J. G. Conklin (April 23): The eastern tent caterpillar was observed hatching in southern New Hampshire on April 19. On April 22 a heavy windstorm, accompanied by snow and sleet, occurred and many of the newly hatched caterpillars were destroyed.

Vermont. H. L. Bailey (April 23): First hatching of the eastern tent caterpillar was observed at Brattleboro, in the southern corner of the State, on April 23. Egg masses moderately abundant.

Massachusetts. A. I. Bourne. (April 19-2): Eggs were found to be hatching by the 19th in some sections. The pest is still very abundant over the State.

Rhode Island. A. E. Stene (April 29): We have noticed quite a number of tent caterpillar webs; apparently a high percentage of the eggs are hatching.

Connecticut. P. Garman (April 20): Egg masses of the tent caterpillar much less abundant than during the last 3 or 4 years. Eggs have now hatched in some localities in New Haven County.

E. P. Felt (April 24): Apple tent caterpillars are present in small numbers locally in southwestern Connecticut.

New York. R. E. Horsey (April 17): Hundreds of egg masses of the eastern tent caterpillar noted in territory south of Rochester and in the city nearby, where they were severe last year. Often a dozen or more egg masses are found on one tree. A large number were found on an ornamental planting of crabapples that had the nests removed and the caterpillars destroyed last spring and summer, wherever found. No defoliation was noticeable here last fall, but evidently enough caterpillars escaped to mature a number of moths.

E. P. Felt (April 24): Apple tent caterpillars are present in small numbers here and there in southeastern New York.

M. Kisliuk (April 26): Larvae 1/4 inch long were found in the tents on wild cherry on April 25 at Alley Pond Park and Cunningham Park, Long Island. There were also some unhatched eggs. These insects appear to be less abundant than in 1936.

Pennsylvania. H. N. Worthley (April 21): Egg masses first observed hatching on April 19 at State College, Centre County, in advance of the delayed dormant application to apple.

J. O. Pepper (April 26): Egg clusters do not seem as abundant as last year in eastern Pennsylvania. First hatching of eggs April 12.

E. J. Udine (April 13): Eggs were hatching on April 13 at Carlisle, Cumberland County. Last year in some locations eggs hatched on April 5.

New Jersey. E. Kostal (April 22): Infestations on apple and wild cherry trees at Morganville, Monmouth County, are very moderate, as compared with last 3 years; first larvae noted on April 22, as compared with April 4, in 1936.

South Carolina. C. O. Bare (April 12): An outbreak of the eastern tent caterpillar in Charleston County during the past 2 weeks attracts considerable attention. Nearly all wild cherry trees have been kept defoliated almost entirely, and the tents are frequently on wild plum.

Georgia. O. I. Snapp (March 29): The first colonies of the season were observed on wild cherry at Fort Valley (central part of the State) on March 29. The infestation appears to be lighter than usual.

T. L. Bissell (April 3): Tents of M. americana are present in wild cherry at Griffin, central Georgia, with larvae about one-quarter grown. (April 26): Tent caterpillars are unusually abundant on wild cherry, crabapple, and other fruit trees, and are also found wandering in fields at Experiment, in central Georgia, and at Elberton, in northeastern Georgia.

Florida. A. H. Madden (March 16): A number of full-grown larvae observed at Quincy, Gadsden County, crawling about in search of places to pupate. Apparently not sufficiently abundant to cause appreciable damage.

Tennessee. L. B. Scott (April 14): Many webs of tent caterpillars noticed on wild cherry at Clarksville.

Mississippi. D. W. Grimes (April 24): Numerous colonies on peach trees in vicinity of Durant, west-central part of State.

EYE-SPOTTED BUDMOTH (Spilonota ocellana D. & S.)

New York. N. Y. St. Coll. Agr. News Letter (April 12): In western New York the budmoth is general, but serious only in a comparatively few blocks in Niagara County. Numerous in many orchards in Orleans County.

FLATHEADED APPLE TREE BORER (Chrysobothris femorata Oliv.)

North Carolina. Z. P. Metcalf (April 14): Some cases of very serious damage by the flatheaded apple tree borer have been reported from Anson County, near the central part of the southern boundary.

Kansas. H. R. Bryson (April 19): Numerous reports of trees infested with the flatheaded apple tree borer have been received. The infestations are more numerous owing to the low vitality of the trees, caused by the drought during the last 3 years.

Nebraska. M. H. Swenk (April 22): Complaints of severe damage to fruit and shade trees by the flatheaded apple tree borer continued to be received, principally from the southeastern part of the State, and were concerned with apple, cherry, and other orchard trees, as well as hackberry, Moline elm, American elm, maple and other shade trees.

Oklahoma. F. A. Fenton (April 17): Reports have been received from widely separated parts of the State of injury to orchard and shade trees from the flatheaded apple tree borer.

APPLE FLEA WEEVIL (Crahestes pallicornis Say)

Ohio. T. H. Parks (April 24): Adults were first observed feeding on the young apple foliage on April 23. Very few had left their hibernation quarters under the tree at that time.

SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

Vermont. H. L. Bailey (April 23): Scattering on apple and plum trees at Brattleboro. Many apparently live insects.

New York. R. E. Horsey (April 17): Scarce at Rochester since the cold winter of 1933-34. Some scale lived over at the base of shrubs where they were protected by leaves or snow. This year the scale was found on several cotoneasters, a few being severely infested. Several Prunus spp., all low shrubs, have considerable scale. Four mountain ash trees, 6 to 8 inches in diameter, were a few years ago matted with scale in places on the main trunk, but there is only a little scattered new scale to be found this year.

E. P. Felt (April 24): Very abundant on apple at Jericho, N. Y.

New Jersey. T. L. Guyton (April 5): Numerous and causing death of some limbs and trees at Pittsgrove.

Michigan. R. Hutson (April 22): The survey conducted in southern Michigan in Berrien, Allegan, Grand Traverse, Oakland, and other fruit-producing counties, as well as casual observation in other counties where fruit trees are not so numerous, indicates that very few scale survived the winter. The populations are low in all orchards visited.

Wisconsin. E. L. Chambers (April 24): Scale apparently survived the winter in southern and eastern Wisconsin better than usual because of the mild winter and no low temperature over extended periods. All susceptible host plants in Appleton were sprayed.

North Dakota. J. A. Munro (April 22): One cotoneaster hedge in the northern part of Fargo is heavily infested with San Jose scale.

Georgia. O. I. Snapp (April 20): Infestation has increased rapidly as a result of the uninterrupted reproduction during the unusually mild winter, and the pest is now a serious problem in a number of peach orchards in central Georgia. The infestation is now considerably heavier than usual.

Mississippi. C. Lyle (April 24): The mild winter has been favorable for increasing infestations. Most plant board inspectors reported that it was causing very serious injury in nearly all sections of the State.

Missouri. L. Haseman (April 27): The carry-over in Missouri has been very light this year and comparatively little late dormant spraying has been done.

California. L. D. Christenson (April 23): Within the past 2 weeks we have noted an infestation in an orchard at Hemet.

EUROPEAN RED MITE (Paratetranychus pilosus C. & F.)

Massachusetts. A. I. Bourne (April 26): For the first time since this red mite established itself in the State there is a very general scarcity of the pest. In some orchards the growers have found practically no viable eggs; therefore they are omitting the customary oil sprays. I have found no orchards in which there is a heavy infestation.

Connecticut. P. Garman (April 20): Eggs much less abundant than usual.

Michigan. R. Hutson (April 22): Eggs are scattered in most places, although they are numerous here and there on especially susceptible varieties of trees.

OYSTERSHELL SCALE (Lepidosaphes ulmi L.)

Michigan. R. Hutson (April 22): Infestation from Traverse City, Parma, Saginaw, Grand Rapids, and vicinity have been reported on fruit trees.

Wisconsin. E. L. Chambers (April 24): Oystershell scale on both lilac and apple seems to be on the increase, with very little reduction as a result of winter temperatures.

SCURFY SCALE (Chionaspis furfura Fitch)

New York. E. P. Felt (April 24): Extremely abundant on apple trees near Westbury, L. I.

Pennsylvania. J. O. Pepper (April 26): Abundant in a few apple orchards in Adams County, on the southern boundary, just east of the central part.

PEACH

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Virginia. A. M. Woodside (April 17): No plum curculios emerging from hibernation in Augusta County (central valley).

Georgia. O. I. Snapp (April 21): The appearance of adults from hibernation at Fort Valley (central Georgia) is still considerably less than usual, and the indications are that the infestation this year will be lighter than average. A number appeared on peach trees near favored places of hibernation during the periods March 23-26 and March 29-April 3, but the cool weather prevented them from becoming disseminated throughout the orchards until April 21, when a few were found on trees in the orchards some distance away. Temperatures in the 80's during the period April 17-21 apparently caused this activity; nevertheless, most adults are still confined to outside rows of peach trees. The first C. nenuphar egg of the season was found in a green peach on April 7, and the first larva (not more than 48 hours old) was found in a green peach on April 20. On account of the cool weather in March and April delaying activity of the plum curculio, it is doubtful whether there will be a second generation here this year.

T. L. Bissell (April): One curculio was jarred from wild plum on April 10 at Experiment, in central Georgia, the first of the season. We have been jarring peach and wild plum since the first of March. On April 26 curculios were numerous on peach.

C. H. Alden (April 15): Have been jarring peach trees at Cornelia, in northeastern Georgia, since March 20, but no adults were found until April 13, when 4 were caught on 24 trees. On April 15 caught 23 on 24 trees. The emergence from hibernation is taking place long after full bloom (March 20 to 25) this year, as at this time the shucks are being shed from the peaches in this section.

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Georgia. O. I. Snapp (April 21): There has been no peach-twigg injury from this insect to date at Fort Valley (central Georgia), and first-brood larvae have not yet begun to appear. The first larvae (about 3 days old) of the first brood were found in peach twigs last year on April 16.

Ohio. R. B. Neiswander (April 7): Hibernating larvae were abundant on quince trees in Ottawa County. Scales of bark and crevices yielded as many as 63 living larvae on 1 tree. This condition existed in spite of the fact that birds had taken a considerable number and that approximately 30 per cent died during the winter.

PEACH BORERS (Conopia spp.)

Idaho. R. W. Haegele (April 7): A report on this borer appeared on page 13 of the March 1 issue of the Bulletin. The infestation was first observed in 1936. The trees where this borer was working in the trunk and crotches usually had a heavy infestation of the peach borer (C. exitiosa Say) working at the ground level and below. The infested area was examined on April 7 and all borers found in the trunks or crotches were dead, while the borers below the ground level or the snow line were alive. Minimum temperatures in this area in January ranged from -15° to -20° F.

LESSER PEACH BORER (Synanthedon pictipes G. & R.)

Michigan. R. Hutson (April 22): Lesser peach borer is numerous in the vicinities of Port Huron, Shelby, and Hillsdale.

BLACK PEACH APHID (Anuraphis persicae-niger Smith)

North Carolina. Z. P. Metcalf (April 14): The black peach aphid has been reported from the mountainous section of the State.

South Carolina. W. C. Nettles (April 28): The black peach aphid is more widespread and destructive than ever experienced throughout the Piedmont section of the State, but most especially in Spartanburg County.

Georgia. C. H. Alden (April 20): Attacking peach trees in northern Georgia, mostly replants, but occasionally on old trees. Killed a few replants

before remedy could be applied. Abundant at Alto, Cornelia, Commerce, and Esom Hill. More reports of injury from this insect this year than in any year of the past seventeen.

Mississippi. C. Lyle (April 24): Specimens of this aphid were received from Hattiesburg on April 21. It was causing serious injury to peach.

California. L. D. Christendon (April 23): During the past two weeks we have noted a rather severe infestation of black peach aphids in an orchard in Cherry Valley (near Beaumont).

TARNISHED PLANT BUG (Lygus pratensis L.)

Virginia. A. M. Woodside (April 17): The tarnished plant bug is rather abundant on peach trees.

PEAR

PEAR PSYLLA (Psyllia pyricola Foerst.)

New Hampshire. J. G. Conklin (April 23): On April 19 the pear psylla was very active on pear trees in Durham. The females were ovipositing freely and it is evident that a rather severe infestation will follow.

New York. N. Y. State Coll. Agr. News Letter (April): Eggs of the pear psylla were first observed in the Hudson Valley about April 7 and by the last of the month they were abundant in many orchards. In western New York adults have appeared but few eggs have been laid.

CHERRY

BLACK CHERRY APHID (Myzus cerasi F.)

New York. N. Y. State Coll. Agr. News Letter (April): Eggs of the black cherry aphid are hatching in the lower Hudson Valley.

RICE WEEVIL (Sitophilus oryzae L.)

North Carolina. W. A. Thomas (April 19): The rice weevil has been observed frequently within the past few days feeding in the open blossoms of wild cherry. At Chadbourn the weevil seems to be feeding on the pollen in these flowers.

PLUM

TENT CATERPILLARS (Malacosoma spp.)

California. S. Lockwood (April 20): A tent caterpillar, M. constricta Stretch, in somewhat more than normal numbers, is infesting prunes in Sonoma County. The California tent caterpillar (M. californica Pack.) is much more abundant, and some prunes in Sonoma County are almost completely infested, with from one to seven nests per tree.

GRAPE

GRAPE LEAFHOPPER (Erythroneura comes Say)

Virginia. A. M. Woodside (April 17): On April 16 large numbers of the grape leafhopper were observed under leaves on the ground in woods. Associated with them in Augusta County were a few E. obliqua Say.

Utah. G. F. Knowlton (April 14): Grape leafhoppers have been abundant on grass in a vineyard south of Ogden for some weeks. Buds on grapes and Virginia creepers have not yet begun to burst.

California. C. S. Morley (April 2): Overwintering leafhoppers are numerous under Russian-thistle and other weeds in the Arvin district over half a mile from the nearest vineyards. Hoppers may be found on the grapevines in Kern County.

A TREE CRICKET (Oecanthus latipennis Riley)

Ohio. J. S. Houser (April 8): Specimens sent in from Coshocton by a correspondent who had noticed the large punctures in the vine when trimming his grapes and found the eggs lying parallel to the stem imbedded in the pith.

PECAN

PECAN APHIDS (Aphididae)

Georgia. T. L. Bissell (April 25): Stem mothers of Monellia costalis Fitch and Melanocallis caryaefoliae Davis have just matured at Experiment, central Georgia. They seem rather scarce on pecan.

OBSCURE SCALE (Chrysomphalus obscurus Comst.)

Mississippi. C. Lyle (April 24): A rather general infestation in a pecan orchard at Yazoo City was observed on March 23 by J. Milton. The scale has caused noticeable damage. Moderate-to-heavy infestations in pecan trees on the Delta are reported by D. W. Grimes.

CITRUS

GREEN CITRUS APHID (Aphis spiraecola Patch)

Florida. J. R. Watson (April 21): A. spiraecola increased in March to the heaviest infestation we have had since 1925 but was brought under almost complete control by heavy rains the first part of April, which started a fungus disease. Dry weather for the last 2 weeks has somewhat checked this disease but aphids are still comparatively scarce. The aphid-eating ladybeetle Leis sp. has been established in two additional counties, Brevard and Highlands.

COWPEA APHID (Aphis medicaginis Koch)

Arizona. C. D. Lebert (April 5): The bur clover or cowpea aphid was observed on the ties of citrus trees in the north Phoenix citrus area. No serious injury noticeable.

WHITEFLIES (Dialeurodes spn.)

Florida. J. R. Watson (April 21): In most sections of the Citrus Belt there seems to be an unusually heavy flight of whiteflies this year. D. citri Ashm. has largely emerged in the southern part of the Citrus Belt, but is just beginning to appear in the northern part around Monticello, according to S. C. Hill. The cloudy-winged species (D. citrifolii Merg.) is beginning to appear in the main part of the Citrus Belt.

Mississippi. C. Lyle (April 24): Infestations of whitefly on citrus have been observed in Harrison County and on cape jasmine in Lauderdale County.

COTTONY-CUSHION SCALE (Icerya purchasi Mask.)

Georgia. T. L. Bissell (April 5): More than usually prevalent in southern Georgia counties during the winter and spring. I have reports from Claxton, Evans County, and Reidsville, Tattnall County, both in southeastern Georgia. The first was in satsuma orange, the second not specified.

Alabama. J. M. Robinson (April 22): Active on shrubbery at Geneva the first of April.

Arizona. C. D. Lebert (April 15): Light infestations observed on citrus northeast of Phoenix and Pittosporum tobira at Chandler.

CALIFORNIA RED SCALE (Chrysomphalus aurantii Mask.)

Arizona. C. D. Lebert (April 20): California red scale apparently absent this spring in the Phoenix area. Unable to find a single live scale. We hope the pest has been eradicated.

CITRUS THRIPS (Scirtothrips citri Moul.)

California. R. S. Woglum (April): Citrus thrips have been hatching for 2 or 3 weeks in central California and in some places are now fairly abundant in spite of the cool and rainy weather. Owing to the delayed and prolonged hatch the thrips will not appear to be as abundant as they sometimes are at this time of year. Thrips have been hatching more or less sporadically since the middle of March, but in the past few days have become numerous in some orange orchards in eastern San Bernardino County. They are also appearing freely in occasional lemon orchards, especially in San Bernardino County in orchards that suffered considerable thrips damage last year.

C. S. Morley (April 2): The first citrus thrips were found in the Edison district, Kern County, on March 12.

TRUCK - CROP INSECTS

VEGETABLE WEEVIL (Listroderes obliquus Klug)

Alabama. J. M. Robinson (April 22): Vegetable weevil adults are emerging at Auburn.

Mississippi. C. Lyle (April 14): Causing serious injury to tomato plants at Hazlehurst. Plant board inspectors report that the number of complaints has decreased rapidly with the coming of warm weather.

Louisiana. P. K. Harrison (April 20): Injury is much less than it has been all season. Little damage to mustard and turnip at Baton Rouge.

California. R. S. Woglum (April): Now appearing generally on cover crops in citrus orchards. The pest has not been observed as damaging either the fruit or foliage of mature citrus trees. It feeds and breeds on cover crops such as mustard and malva.

STRIPED CUCUMBER BEETLE (Diabrotica vittata F.)

Virginia. H. G. Walker (April 27): Observed feeding on flower clusters on collard plants at Norfolk on April 19.

North Carolina. W. A. Thomas (April 19): The first specimens observed this season were feeding in the open blossoms of wild cherry, blackberry, and the native plants now in blossom at Chadbourn.

SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata F.)

Virginia. L. W. Brannon (April 19): Observed feeding in the field at Norfolk today on young snap beans for the first time this season. This is about the normal date for appearance of the insect on beans.

A. M. Woodside (April 7): A few adults of the southern corn root worm were jarred from peach tree in Albemarle County (Central Piedmont) on April 7.

Louisiana. C. O. Eddy (April): Adults said to be unusually abundant, especially where larger areas of winter cover crops were planted than usual.

Texas. J. N. Roney (March): Observed from March 8 to the end of the month on turnip, beets, onions, and corn, in Galveston County.

BANDED CUCUMBER BEETLE (Diabrotica balteata Lec.)

Texas. J. N. Roney (March): On turnip, cabbage, beets, and strawberries throughout March, in Galveston County.

California. J. Wilcox and J. C. Elmore (April 14): The beetles were common in a young tomato field, feeding on the leaves, at San Onofre, San Diego County.

SEED CORN MAGGOT (Hylemyia cilicrura Rond.)

Oklahoma. F. A. Fenton (April 17): A report has been received from Okmulgee, in the northeastern part of the State, of an insect destroying corn and young onion seedling plants. The pest has been tentatively identified as the seed corn maggot.

FALSE CHINCHBUG (Nysius ericae Schill.)

North Dakota. J. A. Munro (April 21): False chinchbugs have wintered over in larger numbers than in past years in Fargo.

LEAF-FOOTED BUG (Lentoglossus phyllonius L.)

South Carolina. C. O. Bare (April 24): Approximately 5 percent of about 3 acres of potatoes at Boone Hall Plantation, Charleston County, showed wilted tops and other injury due to feeding by the leaf-footed bug. The field was partly surrounded by woods and adjoined an old tomato field where the insect was numerous last season.

Louisiana. C. O. Eddy (April): The southern leaf-footed plant bug is extremely abundant.

POTATO AND TOMATO

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

Virginia. H. G. Walker (April 27): Emerging from hibernation on April 23 at Norfolk.

Georgia. T. O'Neill (April 1): Appearing and ovipositing on field-grown tomato seedlings just appearing above ground at Tifton and vicinity.

Alabama. J. M. Robinson (April 22): Quite abundant, attacking potatoes and tomatoes at Auburn.

Mississippi. C. Lyle (April 24): Reported generally present in Mississippi at this time, although the infestation is heavy only in spotted localities.

Louisiana. C. O. Eddy (April 24): Although present in small numbers during the last several weeks, arrived in the field in huge numbers during the last week.

POTATO FLEA BEETLE (Epitrix cucumeris Harr.)

Virginia. L. D. Anderson and H. G. Walker (April 27): Began emerging from hibernation between April 15 and 22, at New Church, Accomac County.

TOMATO PINWORM (Gnorimoschema lycopersicella Busck)

Florida. E. W. Berger and G. B. Merrill (April 20): Tomato pinworm infestation in the southern half of the State, peninsular section, is light and has occasioned little if any loss; apparently of long standing but never sufficiently severe to attract attention of growers. First reported in Florida from Bradenton, 40 to 60 miles south of St. Petersburg and Tampa, respectively, in Manatee County, in 1932.

California. J. C. Elmore (April 20): Moths observed flying from tomato plant pile in Orange County. A potato field nearby is lightly infested. Moth emergence from under dead tomato vines was common in March, five moths per plant being counted in one field. New tomato fields were set out, beginning February 1. The cold weather in January killed all tomato vines on which the pinworm often continues development throughout the winter. Survival in the pupal stage, however, has been greater than was expected. (April 21): In an early tomato field near San Pedro, Los Angeles County, 10 plants out of 30 examined were infested. Twenty leaf folds were found. Volunteer tomato plants occurring by the thousands in abandoned fields from last year at Long Beach, Los Angeles County, are heavily infested. (April 22): An early tomato field in the upland area east of Santa Ana, Orange County, is infested. Fourteen pinworms were found on the leaves of 5 out of 10 plants examined.

CORN EAR WORM (Heliothis obsoleta F.)

Ohio. T. H. Parks (April 24): Larvae have been seriously injuring a crop of greenhouse tomatoes this month near Ashtabula. In other years maximum injury in greenhouses has occurred in October and November.

POTATO LEAFHOPPER (Empoasca fabae Harr.)

Mississippi. K. L. Cockerham (April 19): The potato leafhopper was numerous enough on an experimental planting of Irish potatoes at Biloxi to warrant treatment. Slight "hopperburn" was noticeable.

POTATO APHID (Illinoia solanifolii Ashm.)

Louisiana. C. C. Eddy (April 24): The potato aphid became numerous last week.

BEANS

MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

Virginia. L. W. Brannon (April 23): The first beetle of the season was found feeding in the field in the Norfolk area on snap beans on April 23. Daily observations have been made since the first beans were up on April 19; therefore the beetle was no doubt one of the first to emerge.

Alabama. J. M. Robinson (April 22): Adults are active on young beans at Auburn,

Mississippi. L. J. Goodgame (April 24): Has been observed at several places in Monroe County during the last 2 weeks.

BEAN LEAF BEETLE (Cerotoma trifurcata Forst.)

Virginia. L. W. Brannon (April 19): The first beetles of the season were observed feeding on young snap beans in the field at Norfolk on April 19. As only one or two beetles were seen, they are apparently just emerging.

Georgia. C. I. Snapp (April 21): Unusually abundant at Fort Valley (central Georgia), and has already caused considerable damage to the early bean crop.

T. L. Bissell (April 26): Beetles are damaging beans already, plants up about 5 days, at Experiment, central Georgia.

Alabama. J. M. Robinson (April 22): Active on young beans at Auburn.

Mississippi. C. Lyle (April 24): Heavy infestations reported from the sections around Meridian, Durant, and State College.

Louisiana. L. O. Ellisor (April): Very abundant now and has partly defoliated the soybeans planted. Garden beans have also been attacked severely.

CABBAGE

IMPORTED CABBAGE WORM (Ascia rapae L.)

Florida. F. S. Chamberlin (March 4): Cabbage fields in Gadsden County are only lightly infested with larvae.

Ohio. B. J. Landis (April 17): Two adults were observed in flight at Columbus today.

Kentucky. M. L. Didlake (April 23): Adults observed flying at Lexington on April 16.

DIAMONDBACK MOTH (Plutella maculipennis Curt.)

Alabama. J. M. Robinson (April 22): Larvae are active on cabbage at Auburn.

Texas. J. N. Roney (March): Injurious on cabbage and collards during March in Galveston County.

Utah. G. F. Knowlton (April 17): Adults are now abundant on mustards in Utah County.

CABBAGE APHID (Brevicoryne brassicae L.)

Maryland. E. N. Cory (April 23): On cabbage plants at Tifton, Montgomery County.

Virginia. H. G. Walker (April 27): Rather abundant in some fields of seed kale and seed collards but very scarce in fields of spring cabbage at Norfolk.

Alabama. J. M. Robinson (April 22): Abundant at Auburn.

Mississippi. C. Lyle (April 24): Aphid infestations on cabbage are reported from Aberdeen, Yazoo City, Meridian, Ocean Springs, and Granada.

Oklahoma. F. A. Fenton (April 17): Present in widely scattered parts of the State, causing serious damage to young cabbage plants.

HARLEQUIN BUG (Murgantia histrionica Hahn)

Virginia. L. W. Brannon (April 20: Adults have been observed feeding on seed kale plants at Norfolk since April 6. The first eggs were found on April 17. The dates of emergence and oviposition are about normal.

H. G. Walker (April 27): Several bugs had emerged from hibernation at Norfolk on April 12 and were feeding on collard plants.

Georgia. T. L. Bissell (April 3): Adults are collecting in blooming collard plants at Experiment.

Mississippi. C. Lyle (April 24): Abundant in gardens around Meridian. The first reports at State College were about April 15.

ASPARAGUS

ASPARAGUS BEETLE (Crioceris asparagi L.)

California. J. Wilcox (April 22): Adults and larvae in all stages were common at Stanton.

SQUASH

SQUASH BUG (Anasa tristis Deg.)

Iowa. H. E. Jacques (April 22): Passed its hibernation well and is appearing in large numbers.

Utah. G. F. Knowlton (April 21): Appearing at Salt Lake and Sandy.

CELERY

ONION THRIPS (Thrips tabaci Lind.)

Florida. J. R. Watson (April 21): Very abundant on celery in the Sanford and Sarasota districts.

Texas. J. N. Roney (March): Abundant on onions and garlic throughout March in Galveston County.

SOUTHERN MOLE CRICKET (Scapteriscus acletus R. & H.)

Florida. J. M. Tenhet (April 15): Mole crickets are much less abundant than usual in the celery at Sanford.

SPINACH

GREEN PEACH APHID (Myzus persicae Sulz.)

New Jersey. M. D. Leonard (April 26): Reported as moderately abundant on spinach in Camden and Gloucester Counties.

Virginia. H. G. Walker (April 27): Becoming rather abundant in some fields of spinach in the western branch section near Norfolk.

Arizona. V. E. Romney (April 13): Aphids are spotted in fair numbers, and they are found on the tender tips of the seed stocks on sugar beet seed, in the Salt River Valley at Phoenix.

TURNIP

TURNIP APHID (Rhopalosiphum pseudobrassicae Davis)

Tennessee. L. B. Scott (March): Examinations of young cabbage plants showed no infestation. Overwintering turnip plants lightly infested at Clarksville, in the northwest section.

Louisiana. P. K. Harrison (April 20): Natural enemies have reduced the population to noninjurious numbers at Baton Rouge.

STRAWBERRY

STRAWBERRY LEAF ROLLER (Ancylis comstana Froel.)

Idaho. R. W. Hoegeler (April 16): Moths observed emerging in large numbers and flying over strawberry beds in Gem County. Pupae numerous. Newly hatched larvae could not be found.

A WEBWORM (Acrolopius sp.)

Virginia. H. G. Walker (April 27): Root-feeding webworms, identified by C. Heinrich as belonging to the genus Acrolopius, have been causing considerable damage in three fields of strawberries at Capeville, on the Eastern Shore of Virginia.

FIELD CRICKET (Gryllus assimilis F.)

North Carolina. W. A. Thomas (April 24): Black field crickets are giving considerable trouble in the strawberry fields at Chadbourn by gnawing immature and ripe fruit.

Mississippi. H. Gladney (April 24): Light injury to strawberries has been noted in one field in Jackson County, at Ocean Springs.

STRAWBERRY WEEVIL (Anthonomus signatus Say)

Virginia. L. D. Anderson and H. G. Walker (April 27): The strawberry weevil is moderately abundant in the northern part of Accomac County and has already cut off a few of the strawberry buds.

TOBACCO WIREWORM (Monocrepidius vespertinus F.)

North Carolina. W. A. Thomas (April 24): The tobacco wireworm is doing considerable damage at Chadbourn by burrowing into ripe strawberries, especially where the fruit is in contact with the soil.

SLUGS (Mollusca)

North Carolina. W. A. Thomas (April 24): The slugs are particularly abundant in strawberry fields at Chadbourn, where they are eating large areas out of ripening berries, rendering them unmarketable. Some fields are losing 10 percent of the ripe berries.

Nebraska. M. H. Swenk (April 22): From Dawes County on April 19 came a complaint of common garden slugs (Agriolimax agrestis L.) infesting a strawberry bed, having lived through the winter under the mulch.

PEPPER

PEPPER WEEVIL (Anthonomus eugenii Cano)

Florida. J. R. Watson (April 21): A light infestation was found in Sarasota County, the first outside of Manatee County. All but four infested fields in Manatee County have been destroyed and efforts are being made to destroy these.

California. J. C. Elmore (April 20): Collected on April 2 on Solanum nigrum in three localities at San Luis Rey, San Diego County. This is an important pepper-growing district. On April 15 pepper weevils were collected on Solanum umbelliferum near Laguna Beach, Orange County, several miles from commercial pepper plants.

SWEETPOTATO

SWEETPOTATO WEEVIL (Cylas formicarius F.)

Georgia. F. S. Chamberlin (March 4): Inspections in the previously infested areas of Decatur County have shown no infestations.

Florida. F. S. Chamberlin (March 4): Inspections in the previously infested area in Gadsden County by State representatives showed one light infestation.

RING-LEGGED EARWIG (Anisolabis annulipes Lucas)

Mississippi. C. Lyle (April 24): This insect was damaging stored sweet-potatoes at Collins on April 7.

SUGAR BEETS

BEET LEAFHOPPER (Eutettix tenellus Bak.)

Texas. M. J. Jones (March 24): Nymphs and newly emerged adults were found at Eagle Pass, Maverick County, on March 24.

TOBACCO

VEGETABLE WEEVIL (Listroderes obliquus Klug)

Florida. F. S. Chamberlin (April 8): The vegetable weevil, which is injuriously abundant for the first time in Gadsden County, has been found feeding

in considerable numbers in a tobacco plant bed in that county. The injury caused by the larvae consists mainly in feeding on the leaves but they sometimes bore into the crowns.

TOBACCO FLEA BEETLE (Eutrix parvula F.)

North Carolina. Z. P. Metcalf (April 22): Relatively more destructive this year than usual in the eastern two-thirds of the State.

South Carolina. M. Allen and W. H. White (April 28): Two fields at Lake City, Florence County, consisting of $9\frac{1}{2}$ acres of tobacco that had been transplanted on April 6 to 8, were found to be severely injured by this pest. Examination showed that owing to cool weather the plants had not made any appreciable growth; consequently the flea beetles had severely injured the young plants after setting in the field. Blue mold was also a contributing factor in the death of many of the plants examined. Although only a small area of th $9\frac{1}{2}$ acres was examined, the grower was of the opinion that at least 85 percent of his plants would have to be replanted.

Florida. F. S. Chamberlin (March 22): The few flea beetles present in the tobacco plant beds of northwestern Florida are causing no economic damage. No control measures have been necessary this season. (April 3): The first settings of tobacco are being attacked by flea beetles in about the usual numbers in Gadsden County.

Tennessee. L. B. Scott (April 14): First evidence of feeding by tobacco flea beetle in tobacco plant beds in Clarksville on April 14. Damage slight.

SOD WEBWORMS (Crambus spp.)

Kentucky. M. L. Didlake (April 23): Sod webworms excessively abundant in tobacco plant bed near Versailles.

MOLE CRICKETS (Scapteriscus spp.)

Florida. A. H. Madden (March 30): Mole crickets were moderately active in tobacco seed beds in Gadsden County during the month, but did little injury to the plants.

SPRINGTAILS (Collembola)

North Carolina. Z. P. Metcalf (April 14): Numerous specimens sent in by a farmer who complained that they are doing more damage than the flea beetles in his tobacco beds in Edgecombe County.

SLUG (Mollusca)

North Carolina. Z. P. Metcalf (April 14): Several complaints have been received of slugs on tobacco in southeastern North Carolina.

Correction:--The note from Beltsville, Md., on page 376 of the October 1, 1936, Insect Pest Survey Bulletin (vol. 16, no. 8) credited to F. F. Smith, should have been credited to A. C. Davis.

COTTON INSECTS

BOLL WEEVIL (Anthonomus grandis Boh.)

Georgia. P. M. Gilmer (April 17): Indications are that the survival of hibernating weevils will be greater than usual, but because of the light population that went into hibernation, the initial infestation will be rather light. In the hibernating cages the weevils are moving out in numbers that would also indicate a survival above normal, at Tifton, in southern Georgia.

O. I. Snapp (April 26): The first adult of the season was observed today at Fort Valley. It was jarred from a peach tree, which was unusual, as the boll weevil is seldom taken on peach.

Louisiana. R. C. Gaines (April 27): Three boll weevils were taken on screen traps at Tallulah (Madison Parish) on April 17. The record of boll weevils taken on nine flight screen during the past month, as compared with the same periods in 1935 and 1936, is as follows:

Date	:	1937	:	1936	:	1935
April 3 -----	:	0	:	1	:	3
April 10 -----	:	0	:	0	:	6
April 17 -----	:	1	:	0	:	3
April 24 -----	:	2	:	0	:	0
	:		:		:	

Texas. R. W. Moreland (April 27): At College Station, in south-central Texas, the number of weevils found out of hibernation in the cages increased from a total of 146 during the week ending April 10 to 703 during the week ending April 24.

F. L. Thomas (April 17): It is believed that boll weevils will be more abundant in southern Texas than usual, especially on young cotton. Last year's cotton was not killed and the weevils have been active and breeding throughout the winter. In portions of central Texas the early infestation is not expected to be as heavy as last year. The large amount of poisoning last fall and the destruction of unpoisoned foliage by leaf worms (Alabama argillacea Hbn.) contributed to a reduction in the number of weevils to enter hibernation. The survival of those that did go into winter quarters appears fairly high at this time. (April 24): Boll weevils have been flying and are seeking cotton. They already have been taken on screen traps in weeds and in cotton fields at a considerable distance from winter shelter.

PINK BOLLWORM (Pectinophora gossypiella Saund.)

Texas. A. J. Chapman (April 24): There was a heavy emergence of moths from the hibernation cages during the week at Presidio, in the Big Bend of Texas. The emergence thus far indicates that there will be a heavier carry-over this year than last.

SALT-MARSH CATERPILLAR (Estigmene acraea Drury)

Texas. F. L. Thomas: Adults and eggs are rather common in the coast counties north of Corpus Christi, where there is likely to be more trouble than usual.

COTTON FLEA HOPPER (Psallus seriatus Reut.)

Texas. F. L. Thomas (April 17): The insects began hatching from overwintered eggs in the croton weeds as early as February 18 at College Station and, with the exception of 9 days when it was too cold, have been hatching every day since. Although many of the early hatched insects were killed as a result of a few hard rains on cold days, recent observations indicate that there are large numbers of eggs that have not hatched. (April 24): If weather conditions are such as to promote the growth of cotton during the remainder of the spring, severe flea hopper injury may be expected. The hatch from overwintered eggs during the period April 1-15, inclusive, exceeds all records. The average hatch for that period this year was 5,623 insects per 100 croton weeds collected from 8 counties in south-central Texas. The next highest emergence was in 1926, a flea-hopper year, when 4,300 insects hatched from 100 weeds. In 1935 and 1936 the hatch during the same period amounted to 1,000 and 1,106 flea hoppers, respectively. In the lower Rio Grande Valley north of Weslaco no flea hoppers have been seen and no damage has been found on cotton that is from 6 to 8 inches tall and is squaring. They have been reported on cotton in Bexar County.

FOREST AND SHADE - TREE INSECTS

CANKERWORMS (Geometridae)

Connecticut. P. Garman (April 20): Cankerworms (Alsophila pometaria Harr.) less abundant than usual on apple in New Haven County.

E. P. Felt (April 24): Eggs of fall cankerworm (A. pometaria) were somewhat numerous in the vicinity of Stamford.

Iowa. H. E. Jacques (April 22): Male spring cankerworms (Paleacrita vernata Peck.) unusually abundant in flight for the last 3 weeks, which indicates a rather heavy infestation.

New Jersey. M. D. Leonard (April 17): Moths of P. vernata very scarce at Ridgewood.

E. P. Felt (April 24): Fall cankerworm eggs were abundant in woodlands at Madison.

Pennsylvania. J. O. Pepper (April 26): Spring cankerworm abundant locally in eastern Pennsylvania. Adults found emerging in large numbers on March 30.

Ohio. T. H. Parks (April 24): Cankerworm moths were observed in flight around lights during the latter half of March and the first week of April.

Michigan. R. Hutson (April 22): Indications are that cankerworms will be quite numerous since eggs of the fall species are readily found almost anywhere.

North Dakota. J. A. Munro (April 21): Emergence of spring cankerworm adults in the vicinity of Fargo indicates moderate defoliation to trees later in the season.

FOREST TENT CATERPILLAR (Malacosoma disstria Hbn.)

Vermont. H. L. Bailey (April 27): The forest tent caterpillar was noted at Essex, on the western side of the State, on April 16, hatching from egg masses plastered on tree trunks. No hatching from egg masses on twigs was in evidence.

Pennsylvania. J. O. Pepper (April 26): Egg masses found rather abundant in northeastern Pennsylvania.

South Carolina. C. O. Bare (April 23): For several days debris falling like rain under live oaks at the South Carolina Truck Experiment Station at Charleston has been due to the numerous forest tent caterpillars feeding on them. Reports are that the caterpillars are seen in many places in this section of the State, defoliating the trees, and crawling across the highways.

W. C. Nettles (April 20): The forest tent caterpillar is unusually severe in the Walterboro section and is said to be defoliating a number of deciduous trees.

Mississippi. C. Lyle (April 24): This caterpillar was collected on pecan at Lumberton on April 12.

BOXELDER

BOXELDER APHID (Periphyllus negundinis Thos.)

Mississippi. C. Lyle (April 24): An extremely heavy infestation on boxelder was reported from Yazoo City on April 20.

ELM

WOOLLY APPLE APHID (Eriosoma lanigerum Hausm.)

Mississippi. C. Lyle (April 24): Aphids were very abundant on elms in Jackson and at State College early in April.

EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

Wisconsin. E. L. Chambers (April 24): While the hot, dry summer greatly reduced the infestation of European elm scale in Madison and Milwaukee, the surviving young scales were not apparently reduced any by winter. Spraying of all infested trees in Madison now in progress. Buds not yet started on any of the trees because of delayed cold spring.

Utah. G. F. Knowlton (April 14): Some spraying for European elm scale has been done in northern Utah localities. This insect causes extensive damage to elms throughout northern Utah.

EUROPEAN FRUIT LECANIUM (Lecanium corni Bouche)

Oklahoma. F. A. Fenton (April 17): The European fruit lecanium has been reported as seriously damaging elms at Perry and Ponca City, in the north-central part of the State.

OAK

GOLDEN OAK SCALE (Asterolecanium variolosum Ratz.)

New York. E. P. Felt (April 24): Golden oak scale was extremely numerous on chestnut oak twigs at Cold Spring Harbor, N.Y.

OAK LECANIUM (Lecanium quercifex Fitch)

Georgia. T. L. Bissell (April 26): Water oak twig sent in today from Jackson, central Georgia, heavily infested. Eggs just started to hatch.

Mississippi. C. Lyle (April 24): Specimens on oak were received from Brooklyn on April 12 and from Sharon on April 15.

PINE

EUROPEAN PINE SHOOT MOTH (Rhyacionia buoliana Schiff.)

New York. E. P. Felt (April 24): A few cases of injury were reported from White Plains.

NANTUCKET PINE SHOOT MOTH (Rhyacionia frustrana Comst.)

Alabama. J. M. Robinson (April 22): The larvae of the Nantucket pine moth were active on small pines at Ozark during the first half of April.

A MIDGE (Contarinia resinicola O. S.)

Ohio. J. S. Houser (March 23): Large specimen white pine trees on two estates at Gates Mills bore numerous exudations of resin around pruning scars, points of injury, and on the undersides of branches where they leave the trunk or limbs. The principal damage done is that of inhibiting the healing of wounds and disfiguring the tree. Occasionally this insect has been observed in Ohio, but never before to the extent shown in this instance.

RED-HEADED PINE SAWFLY (Neodiprion lecontei Fitch)

New York. E. W. Littlefield (Spring 1937): Destroys some entire plantations of Pinus resinosa. Has become epidemic in the Black River Valley. Reported sporadically from other localities.

A SPITTLEBUG (Aphrophora parallela Say)

New York. E. W. Littlefield (Spring 1937): Destroys entire plantations of Pinus sylvestris. Has become epidemic in Hudson Valley during the last 2 years.

PINE NEEDLE SCALE (Chionaspis pinifoliae Fitch)

Wisconsin. E. L. Chambers (April 24): Mugho, white, and Austrian pine twigs have been sent in for identification of pine needle scale and infested trees seem to have had infestation reduced very little, because of mild winter weather.

POPLAR

POPLAR VAGABOND APHID (Mordwilkoja vagabunda Walsh)

Nebraska. M. H. Swank (April 22): The vagabond cottonwood gall caused by this aphid was reported from Sheridan County on March 5 and from Grant County on April 3.

SPRUCE

EASTERN SPRUCE BEETLE (Dendroctonus piceaperda Hopk.)

New York. E. W. Littlefield (Spring 1937): Kills elder trees only. Epidemic on Picea rubra throughout an area of undetermined extent.

INSECTS AFFECTING GREENHOUSE
AND ORNAMENTAL PLANTS

EUROPEAN EARWIG (Forficula auricularia L.)

Washington. E. W. Jones (April 19): The overwintering adults have emerged from the soil this month and are abundant in the flower gardens at Walla Walla.

OYSTERSHELL SCALE (Lepidosaphes ulmi L.)

New York. R. E. Horsey (April 17): A bad infestation on Lonicera spp. at Rochester. Numerous other Lonicera nearby were free of scale. One Amelanchier sp. severely infested and 2 more slightly so in a group of 15 shrubs of the same kind.

North Dakota. J. A. Munro (April 22): Many cotoneaster hedges in the vicinity of Fargo are heavily infested.

SOFT SCALE (Coccus hesperidum L.)

Alabama. J. M. Robinson (April 22): The soft brown scale was attacking shrubbery at Union Springs the middle of April.

ARBORVITAE

ARBORVITAE APHID (Lachnus thujafilina Del Guer.)

Mississippi. C. Lyle (April 24): Specimens on arborvitae were collected at Fayette on March 27. Plant Board inspectors report these aphids unusually abundant at Meridian, Aberdeen, and Jackson.

Arizona. C. D. Lebert (April 4): Observed in several residential plantings in Phoenix. Thus far the interiors of the host plants were free from mold or excess of honey dew, which is usually present.

AZALEA

A SCALE INSECT (Pseudocnida paeoniae Ckll.)

South Carolina. F. F. Smith (April 10): Generally present in older azalea gardens at Charleston. Severely infested plants develop sparse foliage, few or no flowers, and gradually die.

BOXWOOD

BOXWOOD PSYLLID (Psyllia buxi L.)

Maryland. E. N. Cory (April 5): Boxwood psyllid attacking boxwood at Chestertown.

CHRYSANTHEMUM

CHRYSANTHEMUM GALL MIDGE (Diarthronomyia hypogaea Loew)

Kentucky. M. L. Didlake (April 23): Chrysanthemum midge, galls, larvae, and pupae at Lexington.

Ohio. E. W. Mendenhall (April 27): The chrysanthemum midge is injuring chrysanthemum plants in greenhouses in Springfield.

CHRYSANTHEMUM APHID (Macrosiphoniella sanborni Gill.)

Mississippi. C. Lyle (April 24): This aphid is reported as numerous on chrysanthemum at Meridian.

Arizona. C. D. Lebert (April 3): Observed in nearly all plantings around Phoenix. In several places the stems of the plants were completely covered for a length of from 6 to 8 inches.

EUONYMUS

EUONYMUS SCALE (Chionaspis euonymi Comst.)

New York. R. E. Horsey (April 24): A foundation planting along a building at Rochester was so badly infested that it was necessary to cut it to the ground. Other foundation plantings were also found almost completely covered with this scale.

E. P. Felt (April 24): The euonymus scale was numerous on euonymus twigs at Jericho, N. Y.

Mississippi. C. Lyle (April 24): On euonymus from Mendenhall on April 2.

GLADIOLUS

GLADIOLUS THRIPS (Taeniothrips simplex Morison)

Florida. J. R. Watson (April 21): The gladiolus thrips is quite common in the big bulb-growing district of Manatee County.

GRAPE MEALYBUG (Pseudococcus maritimus Ehrh.)

Maryland. E. N. Cory (April 2): Mealybug on gladiolus at Baltimore.

IVY AND OLEANDER

OLEANDER SCALE (Aspidiotus hederæ Vallot)

Arizona. C. D. Lebert (April 15): A heavy infestation was found on a large estate northeast of Phoenix. Several banks of ivy and about 80 oleanders were affected. On many of the oleanders about 30 percent of the leaves were dead.

JUNIPER

JUNIPER WEBWORM (Dichomeris marginellus F.)

Maryland. F. F. Smith (April 6): Juniper webworm infestation noticed at the Research Center at Beltsville and also at Silver Spring. Larvae are enlarging their webs extensively as the weather becomes warmer.

E. N. Cory. Juniper webworm on trees at Queen Anne, Talbot County.

Virginia. I. F. Saunders (April 19): An infestation at Hillsville, in western Virginia, where the juniper webworm is killing juniper. The juniper shrubs are being fast covered with the webworms, spinning their webs on the outer parts of the shrubs and laying their eggs on the stems of the terminal twigs and in the axils of the needles.

NARCISSUS

BULB MITE (Rhizoglyphus hyacinthi Edv.)

Nebraska. M. H. Swenk (April 22): An easter lily bulb sent in from Box Butte County on January 16 was found badly infested with the bulb mite. Specimens of the collembolans Cyphodeirus albinus Nicolet and Isotoma viridis Bourlet were also found on the bulb. A Madison County correspondent reported narcissus bulbs infested with the mite on April 14.

RHODODENDRON

RHODODENDRON BORER (Sesia rhododendri Zenth.)

Connecticut. E. P. Felt (April 24): The rhododendron borer was found at work on rhododendrons at Stamford.

ROSE

ROSE APHID (Macrosiphum rosae L.)

New Jersey. M. D. Leonard (April 24): Fairly numerous on new shoots of a number of garden rose bushes and vines at Haddonfield. Mostly apterous forms, but a few with wing pads.

Mississippi. C. Lyle (April 24): Aphids, probably M. rosae, are unusually abundant on roses at Jackson, Morton, Meridian, and other points in central Mississippi.

ROSE SCALE (Aulacaspis rosae Bouche)

New York. R. E. Horsey (April 17): Rose scale not common but some found on roses at Rochester.

SNOWBALL

SNOWBALL APHID (Aphis viburnicola Gill.)

Minnesota. A. G. Ruggles (April 24): Snowball aphid eggs came through the winter perfectly and are ready to hatch.

I N S E C T S A T T A C K I N G M A N A N D
D O M E S T I C A N I M A L S

MAN

SANDBLIES (Culicoides spp.)

Georgia. J. B. Hull (March): During the latter part of March the spring emergence of sandflies began in the vicinity of Savannah. Complaints were received, especially from residents of Wilmington Island.

Florida. J. B. Hull (March): On the island near Ft. Pierce sandflies annoyed workers almost every calm morning in March. On March 17 they were worse than they had been at any time previously during the season.

NO-SEE-UMS (Leptoconops sp.)

Utah. G. F. Knowlton (April 14): Biting midges, no-see-ums, are annoying to man at Promontory Point and west of Warren, in Weber County.

AMERICAN DOG TICK (Dermacentor variabilis Say)

Maryland. F. C. Bishopp (April 18): This tick has appeared in moderate numbers during the last few days from Washington, D. C., and nearby Maryland. The absence of reports of the activity of this tick, together with field observations, indicates that it has just appeared in noticeable numbers.

Delaware. F. C. Bishopp (April 23): A few ticks were found on dogs in central Delaware. They are said not to have been in evidence earlier this spring.

BLACK WIDOW SPIDER (Latrodectus mactans F.)

Nebraska. M. H. Swenk (April 22): A basement in Dawes County was reported on April 19 as infested with the black widow spider.

Montana. H. B. Mills (April 22): Numerous inquiries have been received concerning the control of black widow spiders.

CATTLE

SCREWORM (Cochliomyia americana C. & P.)

United States. W. E. Dove (April 30): The end of April finds the screwworm limited to the peninsular portion of Florida and to the southern counties of Texas, with indications of a slight gradual spread. Specimens of larvae obtained from other States were found not to be C. americana. Wound infestations occurring in other States were found in horn bases of dehorned animals and navels of calves and were usually identified as Phormia sp. For the 4-week period ended April 23, screwworm control workers reported 4,310 cases from Florida as follows: Cattle 3,108, hogs 1,093, horses 25, mules 5, goats 51, sheep 11, and other animals 17. The predisposing causes were tick bites 16, castrations 335, dehorning 53, marking 206, branding 45, in mothers of young animals 82, in navels of young 2,832, breeding injuries 3, dog bites 100, snags and scratches 436,

horn fly bites 2, warts 9, hog bites 134, boils 19, and others 38. The larger number occurred in navels of young animals and in surgical operations which received infestations during the abnormally early occurrence of the spring season. In Texas specimens of C. americana larvae occurred in localized areas as far west as Comstock, and a fly was found by W. L. Barrett at Langtry (both in Val Verde County). The most northern point was Sonora, and the most eastern point was in Matagorda County. Localized outbreaks on individual ranches were found in Uvalde, Kinney, and Bexar Counties, where stockmen made efforts to get the cases treated. The shearing of sheep is advancing ahead of the spread of screwworms and shear cuts are being treated by stockmen throughout the sheep- and goat-breeding area. Efforts are being made to prevent a big build-up of a screwworm population. For the 4-week period ended April 23, there were 1,339 cases reported from the southern counties of Texas. They occurred as follows: Cattle 1,707, hogs 5, horses 36, goats 36, sheep 154, and others 1. The predisposing causes were as follows: Castrations 141, dehorning 55, branding 32, shear cuts 23, lamb docking 59, mothers of young 44, navels of young 1,446, dog bites 33, snags and scratches 62, warts 1, hog bites 1, boils 1, rams fighting 5, and others 35. Stockmen with infested animals are screwworm conscious and are treating their cases promptly.

STABLE FLY (Stomoxys calcitrans L.)

Georgia. E. R. McGovran (April 26): On warm days during January, February, and March a few stable flies were observed annoying cattle in the vicinity of Valdosta.

Mississippi. E. W. Dunman (April 15): The stable fly has been moderately abundant throughout the winter and is now present in great numbers in Washington County.

Texas. E. W. Laake (April 20): Stable flies are still rather scarce, there being an average of about 5 per animal on a dairy herd of approximately 80 cows.

HORN FLY (Haematobia irritans L.)

Georgia. E. R. McGovran (March): On warm days during January, February, and March, a few horn flies were observed feeding on cattle in the vicinity of Valdosta. During the latter part of March there was a noticeable increase in the number of horn flies attacking cattle.

Texas. E. F. Knipling (April 12): Horn flies were estimated to average 150 per head on cattle in the northern part of Cameron County. Horn flies on about 50 cattle observed on April 12 in the western part of Hidalgo County and in Starr County averaged less than 5 per head.

Texas. E. W. Laake (April 20): Horn flies have increased rapidly during the last week or two. The average number per animal on a dairy herd of about 80 animals was approximately 100.

BUFFALO GNATS (Eusimulium spp.)

Mississippi. C. Lyle (April 24): On account of alternating periods of warm and cold weather this spring, buffalo gnats have not caused as much trouble as was expected. During the past month they have been observed at various localities in the Delta and in the adjacent hill sections. A

complaint of very serious injury to chickens by gnats was received from Water Valley on April 17.

Utah. G. F. Knowlton (April 14): Simuliidae, principally E. vittatum Zett., are becoming moderately abundant along streams at Salt Lake City, Mill Creek, and Granite.

CATTLE GRUBS (Hypoderma spp.)

North Dakota. J. A. Munro (April 21): Cattle in the Fargo vicinity are free of cattle grubs, except for an occasional animal brought in from western areas where cattle grubs are a real problem. In a recent shipment of three head of cattle brought in from western North Dakota, it was noticed that one of the cattle had eight grubs. The grubs have recently begun to leave the backs of the animals.

Kansas. H. R. Bryson (April 17): E. G. Kelly reports the appearance of H. lineatum De Vill. later than usual, none having been observed to date.

Texas. E. W. Laake (April 20): No cattle grubs were found in a herd of approximately 80 cows.

CATTLE BITING-LOUSE (Bovicola bovis Nitz.)

North Dakota. J. A. Munro (April 21): Cattle in the vicinity of Fargo were heavily infested during the past winter. Reports indicate a fairly state-wide distribution.

GULF COAST TICK (Amblyomma maculatum Koch.)

Florida. E. R. McGovran (April 26): A few nymphs of the Gulf coast tick were found on birds in the vicinity of Gainesville on March 16. Examinations of cattle in Alachua County during March indicated that the ticks had not yet begun to attack livestock.

Mississippi. C. Lyle (April 27): A complaint that A. americana was very numerous at Fulton, causing trouble on cattle, was received on April 5.

Texas. E. F. Knipling (April 26): Of 19 meadowlarks examined on March 10, 17 were infested with larvae and nymphs of the Gulf coast tick. An average of 3.68 ticks per bird were collected. The number of nymphs far exceeded that of the larvae, the proportion being 61 to 9. On March 23 an examination of 20 meadowlarks showed all the birds infested with from 1 to 7 nymphs or larvae each, the average being 3.65. Three field sparrows examined on March 10 were infested with a total of 10 ticks. Six cowbirds examined on March 23 were all found to be infested with an average of 1.8 ticks per bird. Examinations of cattle in Brooks, Willacy, and Cameron Counties during March indicated that the ticks has not yet begun to attack livestock.

HORSES

HORSE BOTFLIES (Gastrophilus spp.)

Texas. E. F. Knipling (April 26): Horse botflies (G. nasalis L.) were attacking horses and mules in the northern part of Cameron County on March 22.

E. F. Knipling (April 26): Horse botflies (G. intestinalis Deg.) were observed ovipositing on horses in Willacy County on March 23.

HOUSEHOLD AND STORED-PRODUCTS INSECTS

TERMITES (Reticulitermes spp.)

- Connecticut. N. Turner (April 20): Flights of R. flavipes Koll. started in January in heated buildings and have continued to date. The usual large numbers of buildings were found infested, and much damage was reported.
- New Jersey. J. C. Silver (April 17): Migration of R. flavipes started about April 1 and is continuing. Reports of several infestations found in a Bloomfield office building, also at Glenridge, East Orange, and other places. Over 25 infestations were reported to this office last spring.
- Pennsylvania. J. O. Pepper (April 26): Swarms of termites have been reported from several houses in the vicinity of Philadelphia.
- Ohio. T. H. Parks (April 24): Swarming of termites was very limited until April 3. Since then many complaints have been received.
- Indiana. J. J. Davis (April 26): Inquiries concerning termites are now coming in at a rapid rate, active swarming having been delayed this year until a few weeks ago.
- Illinois. W. P. Flint (April 26): Many reports have been received, accompanied by specimens of adult termites, showing that general swarming is taking place throughout central and southern Illinois. So far all swarms reported have been from buildings, probably most of them heated.
- Kentucky. M. L. Didlake (April 23): Termites reported at Lexington.
- Texas. F. L. Thomas (April): Five records of termites in Bryan and College Station received since April 15, when they began swarming. One report received of termites at Waelder, Gonzales County, on April 19.
- Montana. H. B. Mills (April 1): Termites. Swarming from the foundation of a building, the floor of which was weakening. An infestation of termites was discovered in a building in Hardin on April 1.
- California. R. E. Campbell (April 20): Flights of subterranean termites were observed at Alhambra on April 14, and several calls were received reporting flights elsewhere in that vicinity.

ANTS (Formicidae)

- Maryland. E. N. Cory (April 2): Reports received of black carpenter ant (Camponotus pennsylvanicus Deg.) in a house at Cockeysville on April 2.
- Kentucky. M. L. Didlake (April 23): Ants in lawns and plant beds at Franklin and Oak Grove on April 23.
- Mississippi. C. Lyle (April 24): Numerous complaints of ants, probably Solenopsis xyloni McCook, have been received from various sections of the State during the past month.

Nebraska. M. H. Swenk (April 22): Complaints of the basement ant (Lasius interjectus Mayr) as present in the basements of houses were received on February 23 and March 6 from Douglas and Boone Counties, respectively. On February 26 a correspondent from Keyapaha County complained of the mound-building prairie ant (Pogonomyrmex occidentalis Cress.) having formed a large mound on ground that was to be used for a garden.

Oklahoma. E. A. Fenton (April 17): Several requests have been received concerning control of the red harvester ant (P. barbatus F. Smith.)

BROWN-BANDED COCKROACH (Supella supellectilum Serv.)

Wisconsin. C. L. Fluke (April 20): This tropical or subtropical species was taken in numbers infesting a home in Mazomanie, Dane County. The roaches were numerous enough to require control measures.

HOUSE CRICKET (Gryllus domesticus L.)

Mississippi. C. Lyle (April 24): Serious damage to clothing by this insect was reported from Philadelphia on April 20.

TISSUE-PAPER BUG (Thyrodrias contractus Mots.)

Illinois. C. L. Metcalf (April 16): I have another report of "the tissue-paper bug" (T. contractus) from 5034 Washington Boulevard, Chicago, with the statement that this pest was found on pantry shelves, on the floors of four rooms, and, especially, crawling up the walls in bedrooms and closets.

A BEETLE (Melitomma sericeum Harr.)

Ohio. T. H. Parks (April 24): These beetles were brought in on April 19 with the statement that they were emerging from chestnut beams in a recently constructed house in Columbus. They were identified by J. N. Knull.

PEA WEEVIL (Bruchus pisorum L.)

Idaho. C. Wakeland (April 19): T. A. Brindley reports that winter survival of the pea weevil ranged from naught to 44 percent under the bark of ponderosa pine in the vicinity of Moscow. The minimum temperature adjacent to the trees where there was no survival was -21° F. Under the bark and in cracks of fence posts, survival ranged from 0.99 to 17.06 percent, and the minimum temperature for Moscow, which is the closest point where temperatures are available, was -30°. Hibernation cages placed in Weather Bureau kiosks throughout the State have shown that 100 percent mortality occurred under these conditions.

HOUSE CENTIPEDE (Scutigera forceps Raf.)

Kansas. H. R. Bryson (April 20): A report received of considerable infestation of house centipedes in a house at Enterprise on April 20.

THE TWO BROODS OF PERIODICAL CICADA SCHEDULED TO APPEAR IN 1937

Brood XXIII of the periodical cicada, the largest brood of the 17-year race, will occur throughout the Mississippi and lower Ohio River Valleys from southern Indiana and Illinois, and northern Missouri to southern Mississippi and Louisiana.

The best authenticated records of this brood are from western Tennessee and northern Mississippi, although its occurrence is well established throughout the remainder of its area. There is also a small and somewhat isolated center in northwestern Georgia.

Following is a list of the records available to the Insect Pest Survey. Under each State the counties (underlined) are arranged alphabetically and under each county the towns are arranged alphabetically. The numerals following a town indicate the year or years the brood was recorded from that town; those after the county indicate that the record was for the county and gave no specific town. Counties or towns without dates are from records of the brood without any definite year of appearance.

ALABAMA:

Barbour, Hawkinsville 1885; Calhoun, Duke 1885, 1898; Etowah.

ARKANSAS:

Arkansas, Arkansas Post 1898, Gillett 1898, Payer 1885, Stuttgart 1898; Ashley, Motoka 1898; Calhoun, Woodberry 1898; Carroll, Carrollton 1898; Chicot, Carmel 1898, Dermott 1898, Grand Lake 1885, 1898, Lake Village 1898, Luna Landing 1885; Clark, Smithton 1898; Columbia 1885; Craighead, Gilkeson 1898, Jonesboro 1898; Crawford, Alma 1898; Crittenden, Clarketon 1898; Cross, Cherry Valley 1872, 1885, 1898, Vannsdale 1898, Wynne 1898; Desha 1885, Dumas 1898, Rotan 1898; Franklin, Charleston 1885; Fulton, Afton 1898, Mammoth Spring 1885, 1898; Garland 1898; Hot Spring, Ors 1898, Sanders 1898; Howard, Picayune 1898; Izard, La Crosse 1885; Jackson 1885; Jefferson 1885, Altheimer 1898, Pine Bluff 1898, Redfield 1898; Lafayette, Buckner 1898; Lee, Haynes 1898, La Grange 1898, Marianna 1924, Phillips 1898, Sylarsville 1898, Vineyard 1885, 1898; Lincoln, Cornerville 1898; Logan, Hobart 1898, Morrison Bluff 1898; Lonoke, Cobbs 1898, Lonoke 1898; Marion, Yellville 1885, 1898; Mississippi, Athelstan 1898, Chickasawba 1898, Osceola 1885; Monroe, Holly Grove 1898, Roe 1898; Nevada, Falcon 1885; Newton, Boxley 1898; Phillips 1859, 1885, Helena 1898, 1911, Northcreek 1898; Pike, Murfreesboro 1898; Poinsett, Harrisburg 1898, Weiner 1898; Prairie 1885,

De Valls Bluff 1898; Hazen 1898; Pulaski, Hensley 1898, Jacksonville 1898; Little Rock 1885; Saint Francis, Forrest City 1898, Wheatley 1898; Saline 1885; Searcy 1885; Sebastian, Lavaca 1898; Sharp, Center 1898; Union, New London 1898; Van Buren, Sang 1898; Washington, West Fork 1898; White, Bradford 1885; Woodruff, Hunter 1885, 1898, McCrory 1898; Yell, Alberta 1898.

GEORGIA:

Chatham, Savannah 1924; Cobb, Marietta 1885; Coweta 1859, 1885; De Kalb 1846, 1859, 1885; Gwinnett 1846, 1859; Meriwether 1885; Newton 1846, 1859, 1885.

ILLINOIS:

Alexander, Willard 1898; Bond 1898; Clark, Marshall 1898; Crawford, Oblong 1898; De Witt, Clinton 1911, De Witt 1898, Hallsville 1898, Wapella 1898; Edgar, Kansas 1898, Scotland 1898; Edwards, Albion 1898, Grayville Junction 1898; Effingham, Sumner 1898; Gallatin, Shawneetown 1898; Hardin, Karbers Ridge 1898, Cave in Rock 1898; Jackson, Carbondale 1885, 1898, 1924, Elkville 1898, Makanda 1924, Murphysboro 1885; Jasper, Bogota 1898; Jefferson, Bluford 1898; Johnson 1898; Lawrence, eastern part 1924; (?) McLean, Randolph 1898; Macoupin, Chesterfield 1898, Woodburn 1872; Madison, 1898, Highland 1885; Marion, southern part 1898; Montgomery, Nokomis 1898; Perry 1885, Swanwick 1898; Pike, Barry 1898, Pittsfield 1885, Pleasant Hill 1898; Pulaski, Grand Chain 1898, New Grand Chain 1898, Ullin 1898, Villa Ridge 1898; Randolph, Chester 1885, Sparta 1885, 1898; Richland, Berryville 1898, Olney 1898; Saint Clair, Belleville 1898, Marissa 1898, Mascoutah 1898; Scott, Merritt 1885, Manchester 1898; Shelby, Strasburg 1898; Union 1833, 1885, Cobden 1846, 1859, 1872, 1898, Jonesboro 1898; Vermilion, Indianola 1898; Wabash, Mount Carmel 1898, Cowling 1859, 1872, 1885, 1898; Washington, Dubuois 1885, 1898, Okawville 1898; Wayne, Cisne 1898; White, Grayville 1898, Phillipstown 1898; Williamson, western part 1898, Crab Orchard 1885.

INDIANA:

Bartholomew, Columbus 1898; Daviess 1898, 1924; Fayette 1898; Floyd 1898; Gibson 1924, Haubstadt 1898, Oakland City 1898, Princeton 1898; Jackson 1898; Jennings 1898; Knox, Vincennes 1898, 1911, 1924, Wheatland 1898; Montgomery 1898; Owen 1898; Pike 1924; Posey, 1924, Goose Pond 1911, Mount Vernon 1898, New Harmony 1859, 1872, 1885, 1898, Wadesville 1898; Putnam 1898; Spencer 1898; Sullivan, Eagle 1898, Sullivan 1885, 1898, 1924; Tippecanoe, La Fayette 1898; Vanderburgh, Armstrong 1898, Evansville 1898, 1924, Zipp 1898; Vigo 1898; Warrick, Chandler 1898, Newburgh 1898.

IOWA:

Lee 1898.

KANSAS:

Douglas, Lawrence 1911; Neosho 1885.

KENTUCKY:

Central Kentucky 1872; Ballard, Bandana 1898, Hinkleville 1898, Love-
laceville 1898, Ogden 1898, Oscar 1898; Barren; Butler, Barrys Lick 1898,
Morgantown 1898, Woodbury 1898; Caldwell, Kelsey 1898, Princeton 1898;
Calloway, Backusburg 1898, Kirksey 1924; Carlisle, Arlington 1898, Bard-
well 1898, Milburn 1898; Christian, Casky 1898, Crofton 1898; Clinton,
Savage 1898; Crittenden, Kelsey 1898, Leiras 1898; Daviess, Ennor 1885,
1898, Utica 1898; Fulton, Hickman 1872, 1885, 1898; Grant, Sherman 1898;
Graves 1885, Lowes 1898, Mayfield 1898, Pritchard 1898, Fryorsburg 1898;
Green, Thurlow 1898; Hancock, Patesville 1898, Victoria 1885, 1898;
Hardin, Sonora 1898; Hickman, Clinton 1898, Moscow 1898; Hopkins, Madi-
sonville 1898; Letcher, Flint 1898, Sergeant 1898; Livingston, Lola 1898,
Salem 1898; McCracken, Lamont 1898, Grahamville 1898; McLean, Consatlen
1898; Marshall, Briensburg 1898, Sharp 1898; Muhlenburg, Central City
1898, Dunmor 1898; Ohio, Ceralvo 1898, Rosine 1898; Todd, Fairview 1898;
Trigg, Cadiz 1885, 1898, Canton 1898; Union, Saint Vincent 1898; Wetster,
Golds 1898, Sebree 1898; Wolfe, Campton 1898.

LOUISIANA:

Bienville, Liberty Hill 1898; Bossier, Bellevue 1885; Caldwell 1885,
Columbia 1898, Kelly 1898; Claiborne, Homer 1898; Concordia, Progreso
1898, Pandla 1898; East Carroll, 1889, 1924, Atherton 1898, Lake Provi-
dence 1885, 1898; East Feliciana, Olive Branch 1898; Franklin 1885,
1924, Baskin 1898, Crowville 1898, Liddleville 1898; Madison 1924,
Ashley 1898, Tallulah 1898, Waverly 1885; Morehouse 1924, Eastrop 1898,
Bonita 1898, Brodnax 1885, 1898, Mer Rouge 1898; Orachita, Bossco 1898,
Monroe 1898; Pointe Coupee, Forderche 1898; Red River 1872, East Point
1885; Richland 1872, 1924, Archibald 1898, Goshen 1898, Rayville 1885;
Saint Helena, Titus 1898; Tangipahoa, Ponchatoula 1898; Tensas, 1924,
Saint Joseph 1898; Washington 1885; West Carroll 1859, 1885, 1924,
Forest 1898.

MISSISSIPPI:

Most of State 1820; Adams 1898; Alcorn, 1924, Corinth 1885, Kosauth 1898,
Rienzi 1885, 1898; Amite 1885, Bates Mill 1898, Liberty 1898; Axtala,
Sallis 1898; Benton 1924, Hickory Flat 1898; Bolivar, 1924, Rosedale
1885, 1898; Calhoun, 1924, Bentley 1898, Slate Spring 1898, Pittsburg
1885; Carroll 1924, Carrollton 1859, 1872, 1885, Vaiden 1898; Chick-
esaw, Okolona 1885; Claiborne 1885, Port Gibson 1898; Coshoma 1924,
Stovall 1898; Copiah 1924, Ashley 1885, 1898, Beauregard 1872, 1885,
Hazelhurst 1833, 1846, 1859, 1872, 1885, 1898, Wesson 1898; De Soto 1859,
1924, Days 1885, Eudora 1898, Love 1898, Olive Branch 1898; Franklin
1833, 1846, 1924, Little Springs 1885, Meadville 1859, 1872, 1885, 1898,
Suffolk 1911; Grenada 1924, Grenada 1898; Hancock, Claiborne 1885;
Hinds, Cynthia 1898, Newman 1898, Raymond 1885, Terry 1898, Utica 1898;
Holmes 1924, Bowling Green 1898, Lickens 1898, West 1911; Humphreys 1924;
Issaquena, Mayersville 1885; Itawamba, Tilton 1898; Jasper; Jefferson 1898;
Lafayette 1924, Burgess 1898, Oxford 1859, 1872, 1885, 1898; Lawrence,
Monticello 1885, Saulsbury 1898; Leake 1924, Carthage 1885, Nopaca 1898;
Lee 1924, Baldwin 1898; Leflore 1924, Money 1898; Lincoln 1885, Fair
River 1898; Lowndes, Crawford 1898; Madison 1924, Canton 1885, 1898;
Marion, Jamestown 1885, 1898, Pickwick 1898; Marshall 1859, 1872, 1924,

Holly Springs 1885, 1898, Hudsonville 1885, Waites 1911; Montgomery 1835, 1924, Huntsville 1898, Kilmichael 1898, Poplar Creek 1898; Neshoba, Philadelphia 1898; Newton 1885, Chapman 1898, Decatur 1898; Oktibbeha, Maben 1898; Panola, Batesville 1898, Pleasantgrove 1898; Sardis 1872, 1885, 1898; Pike, McComb 1898; Pontotoc 1924, Ecru 1898; Prentiss 1924, Booneville 1898, Wheeler 1898; Quitman, Belen 1898, Marks 1885; Rankin 1924, Brandon 1885, Lynwood 1898; Scott 1885; Sharkey, Cary 1898; Simpson, 1898, Mount Zion 1885; Smith 1885, 1898; Sunflower 1924; Tallahatchie, Rosebloom 1898; Tate 1924, Arkabutla 1898, Senatobia 1885, 1898; Tinipah 1924, Blue Mountain 1898, Ripley 1898; Tishomingo 1872, 1885; Tunica, Wanamaker 1898; Union 1924, Etta 1898, Ingomar 1898, Wallerville 1898; Warren, eastern part 1898, Redwood 1898; Washington 1924, Greenville 1898; Hollandale 1898; Webster 1924, Bellefontaine 1846, 1859, 1872, 1885, Walthall 1898; Yalobusha 1924, Coffeetown 1898; Yazoo 1924, Palmetto Home 1898.

MISSOURI:

Southern part 1924; Adair 1911; Audrain, Mexico 1885, 1898, Rush Hill 1898; Berry 1911, Cassville 1898; Benton, Zora 1898; Bollinger 1911; Boone, Columbia 1898, Rochenort 1872; Callaway, New Bloomfield 1911; Camden, Wonsuch 1911, Purvis 1911; Cape Girardeau 1833, 1846, 1911, Pocahtontas 1859, 1872, 1885, Fruitland 1898, Gordonville 1898, Guardian 1898, Oak Ridge 1898; Cedar 1911, Stockton 1898; Christian 1885, 1911, Sparta 1898; Clark 1911, Alexandria 1898, Ashton 1898; Clay 1911; Clinton, Gower 1898; Cole 1911, Jefferson City 1898; Cooper 1911, New Lebanon 1898, New Palestine 1898; Crawford 1911; Dade 1885, Greenfield 1898; Dallas 1885, Spring Grove 1898; Dent 1911, Gladden 1898; Douglas 1911, Beaver 1885, Cold Spring 1898, Denlow 1898; Dunklin 1911; Franklin 1911; Gasconade 1911, Bay 1898, Bland 1898, Hermann 1885, Stony Hill 1898; Greene 1911, 1885, Nichols 1898, Springfield 1898, Willard 1898; Hickory 1911, Elkton 1898, Wheatland 1885; Howard 1911; Howell 1911, Westplains 1898; Iron, Ironton 1898; Jasper 1911; Jefferson 1911, Belew's Creek 1885, De Soto 1898; Johnson 1885, Holden 1898; Knox 1885, Novelty 1898; Lafayette 1911; Lawrence 1911, Pierce City 1885; Lewis, northwestern part 1898; Lincoln 1911; Linn, Marceline 1898; Maries 1911, Vancleve 1898; Marion 1911; Mercer 1911; Miller 1911, Ulman 1898; Mississippi 1911; Montgomery 1911; Morgan, Gladstone 1898; New Madrid, Morehouse 1898, Point Pleasant 1872, 1885, 1898, Ristine 1898; Newton 1911; Oregon 1911; Osage, Boeger's Store 1885, Chamois 1898, Linn 1898; Ozark, Igo 1898; Pemiscot, Cooter 1898; Perry 1885, Claryville 1898, Perryville 1898; Pettis 1885, 1911; Phelps 1911, St. James 1898; Pike 1911; Polk 1885, Aldrich 1898; Pulaski 1911, Big Piney 1898, Hancock 1898, Richland 1898; Putnam 1911; Ralls 1911; Reynolds 1911, McDoe 1898; Ripley 1911; Saint Charles 1911, Gilmore 1898, Westalton 1898; Saint Clair 1911, Lowry City 1898; Saint Francois, Bismarck 1898, Iron Mountain 1898; Saint Louis, Carondelet 1872, Creve Couer 1898, Eureka 1872; Kirkwood 1872, 1885, Saint Louis 1885; Saline 1911; Schuyler 1911; Scotland 1898, 1911; Scott 1885, Commerce 1911, Sikeston 1911; Shelby 1911; Stone 1911; Sullivan 1911; Taney 1885, 1898, Cedar Creek 1911; Texas, 1911, Stanford 1898, Summersville 1885; Warren 1885, 1911, Holstein 1898, Tuque 1898, Wright City; Washington 1885, 1911, Cadet 1898, Hulsey 1898, Summit 1898; Webster 1885, 1911, Niangua 1898, Seymour 1898; Wright 1911.

OHIO:

Hamilton 1898.

SOUTH CAROLINA:

Edgefield 1872.

TENNESSEE:

Benton 1911, Big Sandy 1898, Camden 1898, Garfield 1885; Carroll 1911, Huntingdon 1885, Post 1898, Westport 1898; Cheatnam 1911; Chester 1911, Henderson 1898, Mifflin 1885, Sweetlips 1898; Crockett 1885, 1911, Chestnut Bluff 1898; Davidson 1885, 1911; Decatur, Decaturville 1885, 1911, Oak View 1898, Parsons 1898; Dickson 1885, 1898, 1911; Dyer 1911, Dyersburg 1898, Finley 1885, 1898, Heloise 1898, Newbern 1898, Templeton 1898; Fayette 1911, La Grange 1872, 1885, Lambert 1898, Somerville 1898, Williston 1898; Gibson 1885, 1911, Fruitland 1898, Nabo 1898; Hardeman 1911, Grand Junction 1872, 1885, New Castle 1898, Whiteville 1859, 1872, 1885, 1898; Hardin 1911, Nixon 1898, Olivehill 1885, Saltillo 1898; Haywood 1911, Nut Bush 1885, 1898, Stanton 1898; Henderson 1872, 1911, Atkins 1898, Lexington 1885, Luray 1885, 1898, Reagan 1898; Henry 1911, Northfork 1898; Hickman 1911; Naomi 1898; Humphreys 1911, Box 1885, Waverly 1898; Lake 1911, Darnall 1885, Tiptonville 1898; Lauderdale 1911, Henning 1885, Orysa 1872, 1885, 1898, Ripley 1833, 1846, 1859, 1872, 1885, 1898; Lewis 1911, Napier 1898; McNairy 1911, Adamsville 1885, 1898; Madison 1911, Claybrook 1885, 1898, Jackson 1872, Malesus 1898, Madon 1898; Maury 1885, 1911; Montgomery, Carbondale 1898; Obion 1885, 1911, D'Arment 1898, Harris 1898, Kenton 1898; Perry 1911, Farmers Valley 1898, Lobelville 1898; Robertson 1872, 1885; Rutherford 1911, Murfreesboro 1898; Shelby 1911, Arlington 1898, Capleville 1898, Dexter 1898, Memphis 1859, 1872, 1898, Ramsey 1885; Stewart 1911, Bear Spring 1898, Lesbia 1898; Tipton 1885, 1911, Atoka 1924, Covington 1859, 1898, Gainsville 1898, Mason 1924, Tipton 1898; Wayne 1911, Clifton 1898; Weakley 1911, Dresden 1885, 1898, Peck 1898; Williamson 1911.

Brood XI of the 17-year race of the periodical cicada is well authenticated only in Massachusetts and Connecticut. Records from other States are more or less problematical and need confirmation.

Following is a list of the records to the Insect Pest Survey on the occurrence of this brood:

CONNECTICUT:

Hartford, Glastonbury 1818, 1835, 1852, Hartford 1903, Suffield 1869, 1886; Windham, Ashford 1886.

DISTRICT OF COLUMBIA:

Woodridge 1920.

ILLINOIS:

Kankakee, Kankakee 1886.

INDIANA:

Fulton 1869; Saint Joseph, Walkerton 1886; Union 1886.

MASSACHUSETTS:

Bristol 1784, Fall River 1767, 1784, 1801, 1818, 1835, 1852, 1869,
Freeton 1818, 1835, 1852, 1869; Franklin Deerfield 1767, 1784, 1801,
1818, 1835, 1852; Hampshire 1767, 1784, 1801, 1818, 1835, 1852,
Hadley 1818.

PENNSYLVANIA:

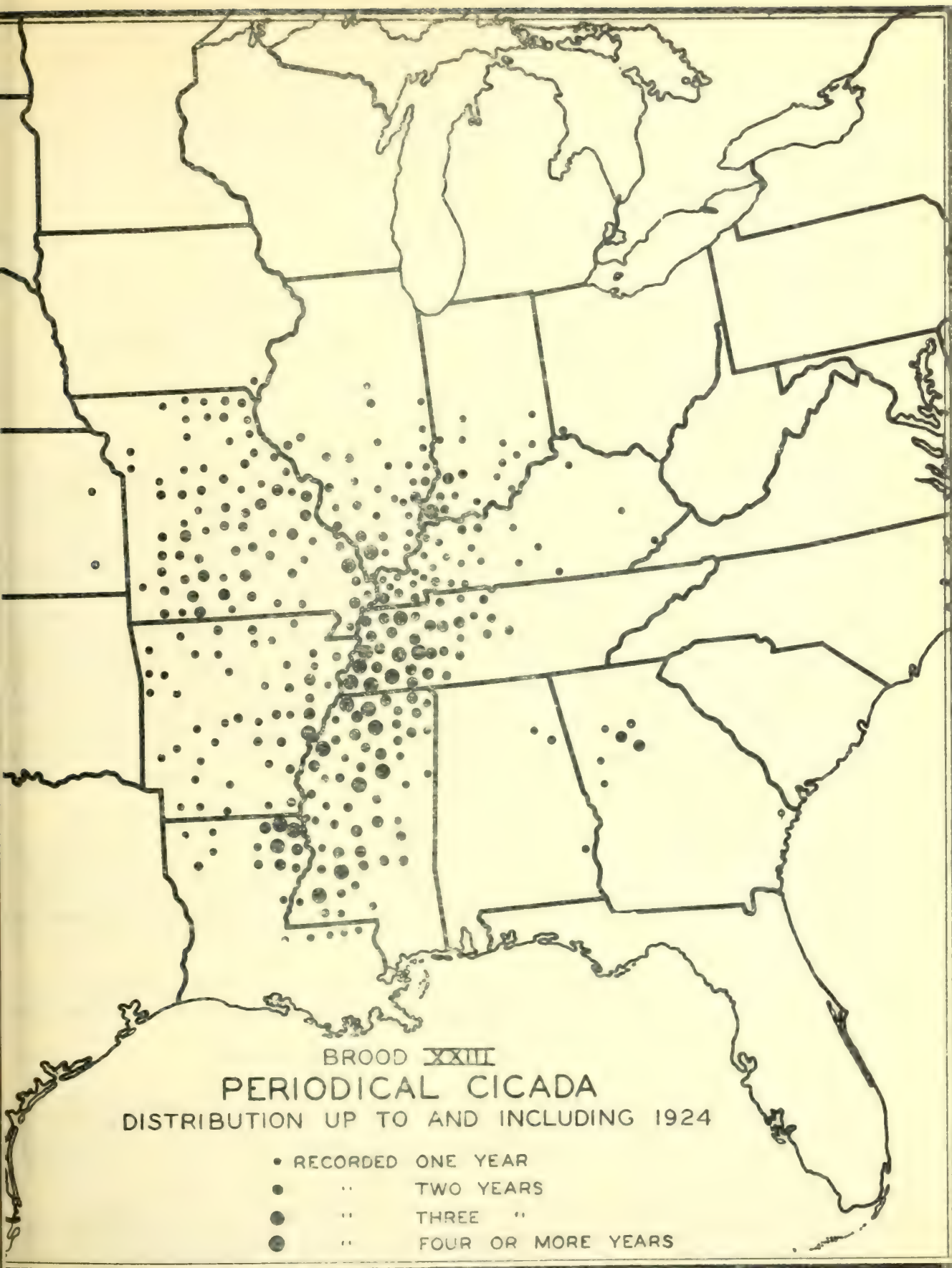
Lancaster, Lancaster 1903.

RHODE ISLAND:

Providence, near Tiogue Reservoir 1869, 1903.

WEST VIRGINIA:

Fayette, Russellville 1852.





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THE SPECIES AND DISTRIBUTION OF GRASSHOPPERS IN THE 1936 OUTBREAK

Robert L. Shotwell ^{1/}

In the years 1934, 1935, and 1936 collections of grasshoppers in typical environments were made during the annual grasshopper survey in the several States included. The specimens collected were identified and counted to determine the percentage of each species in the total number taken in each habitat. Data from the 1934 and 1935 collections were published in the Insect Pest Survey Bulletin supplement 9, volume 14, and as supplement 5, volume 16, respectively. The present report includes the data for the 1936 survey. This grasshopper survey covered 22 States but collections were recorded for only 9 of these. No collections were sent in from Iowa and Nebraska, States included in the 1935 report. Four additional States, viz., Illinois, Missouri, Arkansas, and Oklahoma, were included in the annual survey but in these States not enough collections were made for tabulation purposes. Data on important species in the States where no collections are recorded have been derived from reports by the surveyors. The material for the other States is tabulated and summarized according to principal crops or habitats.

So far as possible, collecting was limited to a certain crop or environment except where the collectors failed to observe these limitations. Because of the limited time available and the pressure of other matters, the collecting was incomplete and not all species present were obtained for any State; however, the results show the general shifts in relative abundance and importance of the more common species.

Collections are here recorded for Colorado, Michigan, Minnesota, Montana, North Dakota, South Dakota, Utah, Wisconsin, and Wyoming.

Weather Conditions during the Summer 1936

Throughout the entire area in which collections were made the summer of 1936 was the hottest and driest on record. In many localities daily maximum temperatures of over 100° F. were recorded during a total of 67 days in June,

^{1/} The writer is indebted to F. D. Butcher, of the Bureau of Entomology and Plant Quarantine, for his part in the identification of the specimens and organization of the material; also to Louis A. Spain, student assistant, who for the past 3 years has had a major part in the systematic work connected with this project.

July, and August. No moisture fell in some areas for 100 consecutive days. In Iowa, Nebraska, and Kansas most of the adult grasshoppers spent the greater part of their time in July and August roosting in the trees and shrubs, where they remained in a more or less inactive state. Collections made on the ground, therefore, could not be representative. Great mortality occurred among the adults from the heat and drought and this phenomenon will probably be reflected in the surveys made in 1937.

Natural Vegetation Areas in which Collections Were Made

The natural vegetation areas included in the grasshopper surveys have been described in detail in the report for 1935, issued as supplement 5, volume 16, of the Insect Pest Survey Bulletin. There are nine general areas, as follows: The northeastern pine forest; the northeastern and southern hardwood areas of Wisconsin and Michigan; the tall-grass prairies, embracing parts of Minnesota, Iowa, the Dakotas, Nebraska, and Kansas; the short-grass, or plains grasslands, of the Dakotas, Nebraska, Kansas, Colorado, Wyoming, and Montana; the foothills of South Dakota and of the mountain States; the montane and alpine meadows of the mountain States; and the northern desert-shrub or sagebrush areas of Wyoming, Utah, and Idaho.

In all of these natural vegetation areas man has disturbed the balance of nature in the original flora by his farming and grazing practices and by introducing new plants. This has had its effect on the grasshopper fauna. Change in the relative abundance of species are rapid. In one year a certain species may be very numerous and even dominant, and in the next year or two it may practically disappear. The build-up of some of these species is due in part to the introduced food plants, largely crops, which, in turn, are more susceptible to weather changes than are the native plants that have become adapted to the environment. Therefore, the many and varied farming and grazing practices have increased instability among the species of grasshoppers and this, in part, accounts for recent outbreaks.

Infestations

The surveys showed the worst infestations to be located in western and southern Iowa, eastern Nebraska, southeastern Colorado, and northern Wyoming, with severe infestations in many other localities. Owing to the extreme heat and drought of the summer of 1936, it is difficult to predict abundance in 1937 in many of these places. For example, in South Dakota there were 26 counties that averaged from 5- to 100-percent infestation in the adult survey, whereas in the egg survey no eggs were found in these counties.

COLORADO

There are five natural vegetation areas in Colorado, viz., the plains, the foothills, low-mountain, high-mountain, and alpine. In 1935 the collection were made in each of these vegetation areas but in 1936 all were made in the farming areas of the plains grasslands. Altogether, 1,735 specimens, representing 39 species, were taken in the following environments: 31 species in corn, 30 species in small grains, 32 species in pastures, 11 species in row crops, and 39 species from roadsides.

Most of the infestation was limited to the eastern half of the State, as most of the western part is mountainous. From severe to very severe infestations were found along the foothill area and in the northeastern, east-central, and extreme southeastern parts. The general population was higher than in 1935.

No collections are recorded for the range areas but heavy infestations of Diastosteira longipennis Thos. occurred in the southeastern quarter of the State. From the standpoint of damage to crops, Melanoplus bivittatus Say, M. mexicanus Guiss., M. femur-rubrum Deg., and M. differentialis Thos. were the most destructive of all the species. Aeoloplus turnbullii Thos. and M. packardii Scudd. were also important species.

Detailed comparisons between collections of 1935 and 1936 cannot be made because that of 1935 was much more extensive than that of 1936. The distribution by species of 1,735 specimens collected in Colorado, expressed in percentages of total number taken in each habitat, is shown in the following table.

Species	Percentage collected in --						Road-side	Total specimens	% of grand total
	Corn	Small grain	Legumes	Range plains	grass	Pasture			
<i>Aeoloplus turnbullii</i> Thos.--	12.54	9.18	4.40	--	--	4.49	7.89	136	7.84
<i>Ageneotettix deorum</i> Scudd.	1.46	1.13	2.80	--	--	.92	1.45	25	1.44
<i>Amphitornus coloradus</i> Thos.	.16	--	--	--	--	.13	.12	2	.11
<i>Arphia pseudonietana</i> Thos.	.33	.42	.20	--	--	.79	.41	7	.40
<i>Aulocara ellioti</i> Thos.--	3.74	.10	1.00	--	--	3.04	1.62	28	1.61
<i>Camula pellucida</i> Scudd.--	--	3.50	--	--	--	4.49	1.97	34	1.95
<i>Chortippus curtippennis</i> Harr.--	--	.63	--	--	--	.79	.34	6	.34
<i>Derotmema haydenii</i> Thos.--	.33	1.14	--	--	--	1.45	.81	14	.80
<i>Dissosteira carolina</i> L.--	.49	.20	--	--	--	.13	3.00	35	2.02
<i>Dissosteira longipennis</i> Thos.--	--	--	--	--	--	--	.06	1	.06
<i>Drepanopterna femoralis</i> Scudd.--	1.46	.10	.20	--	--	1.19	.58	10	.57
<i>Encyrtolophus costalis</i> Scudd.	2.27	--	--	--	--	1.85	.81	14	.80
<i>Hadrotettix trifasciatus</i> Say	.98	.72	--	--	--	.53	.52	9	.52
<i>Hesperotettix brevipennis</i> Thos.--	.15	.10	--	--	--	--	.06	1	.06
<i>Hippiscus ragosus</i> Scudd.--	.33	.20	--	--	--	--	.12	2	.11
<i>Hypochochloa alba</i> Dodge --	.16	--	--	--	--	.13	.06	1	.06
<i>Melanoplus angustipennis</i> Dodge-	7.98	7.52	--	--	--	3.43	4.41	76	4.37
<i>Melanoplus bivittatus</i> Say --	7.00	11.84	9.50	--	--	16.10	10.67	184	10.60
<i>Melanoplus bowditchi</i> Scudd.--	--	.41	--	--	--	.40	.23	4	.23
<i>Melanoplus dawsoni</i> Scudd.--	.16	4.32	--	--	--	.13	.05	1	.06
<i>Melanoplus differentialis</i> Thos.	7.01	--	3.60	--	--	4.36	3.89	67	3.86
<i>Melanoplus femur-rubrum</i> Deg.--	3.75	4.43	45.80	--	--	5.44	16.41	310	17.87
<i>Melanoplus flavidus</i> Scudd.--	1.14	.72	--	--	--	--	.41	7	.40
<i>Melanoplus gladstoni</i> Scudd.--	.82	.10	--	--	--	.66	.29	5	.29
<i>Melanoplus infantilis</i> Scudd.--	.16	.10	.30	--	--	.13	.12	2	.11
<i>Melanoplus keeleri</i> Thos.--	.32	--	--	--	--	.26	.12	2	.11
<i>Melanoplus lakinus</i> Scudd.--	7.66	5.87	3.40	--	--	5.15	3.83	66	3.80
<i>Melanoplus mexicanus</i> Sauss.--	18.74	15.65	17.20	--	--	13.20	16.47	284	16.36
<i>Melanoplus packardii</i> Scudd.--	14.18	7.00	.40	--	--	2.41	5.62	97	5.59
<i>Melanoplus</i> spp. (nymphs)	--	21.22	9.80	--	--	25.21	13.92	240	13.83
<i>Mermiria maculipennis</i> Rehn	.65	.41	--	--	--	--	.23	4	.23
<i>Mestobregma kiowa</i> Thos.--	.49	--	--	--	--	.40	.17	3	.17
<i>Metator pardalinus</i> Sauss.--	.65	--	--	--	--	.53	.23	4	.23
<i>Opeia obscura</i> Thos.--	.33	.21	--	--	--	.13	.12	2	.11
<i>Phlibostroma quadrimaculatum</i> Thos.	2.12	.92	--	--	--	1.48	.75	13	.75
<i>Spharagemon collare</i> Scudd.--	--	1.25	.60	--	--	--	1.10	19	1.09
<i>Spharagemon equale</i> Say --	.81	.51	.60	--	--	.52	.75	13	.75
<i>Trimerotropis campestris</i> McNeill-	--	--	--	--	--	--	.34	6	.34
<i>Trimerotropis laticincta</i> Sauss.--	--	.10	.20	--	--	--	.05	1	.06
Numbers collected	614	967	499	--	--	757	1,708	1,735	--

The percentages of individuals of the various species present in the State of Colorado, arranged according to crops infested, were as follows:

<u>Corn</u>		<u>Small grain</u>	
	<u>Percent</u>		<u>Percent</u>
1. <i>Melanoplus mexicanus</i> -----	18	1. <i>Melanoplus mexicanus</i> -----	15
2. <i>Melanoplus packardii</i> -----	14	2. <i>Melanoplus bivittatus</i> -----	12
3. <i>Aeoloplus turnbullii</i> -----	12	3. <i>Aeoloplus turnbullii</i> -----	9
4. <i>Melanoplus angustipennis</i> -----	8	4. <i>Melanoplus angustipennis</i> -----	8
5. <i>Melanoplus lakinus</i> -----	7	5. <i>Melanoplus packardii</i> -----	7
6. Twenty-six other species-----	41	6. Twenty-three other species----	49

<u>Legumes</u>		<u>Pasture</u>	
1. <i>Melanoplus femur-rubrum</i> -----	46	1. <i>Melanoplus bivittatus</i> -----	16
2. <i>Melanoplus mexicanus</i> -----	17	2. <i>Melanoplus mexicanus</i> -----	13
3. <i>Melanoplus bivittatus</i> -----	9	3. <i>Melanoplus femur-rubrum</i> -----	5
4. <i>Aeoloplus turnbullii</i> -----	4	4. <i>Melanoplus lakinus</i> -----	5
5. <i>Melanoplus differentialis</i> -----	3	5. <i>Aeoloplus turnbullii</i> -----	4
6. Nine other species-----	21	6. Twenty-six other species-----	57

<u>Row</u>		<u>Roadside</u>	
1. <i>Melanoplus femur-rubrum</i> -----	37	1. <i>Melanoplus mexicanus</i> -----	16
2. <i>Melanoplus bivittatus</i> -----	24	2. <i>Melanoplus femur-rubrum</i> -----	16
3. <i>Ageneotettix deorum</i> -----	5	3. <i>Melanoplus bivittatus</i> -----	10
4. <i>Melanoplus lakinus</i> -----	4	4. <i>Aeoloplus turnbullii</i> -----	8
5. <i>Melanoplus mexicanus</i> -----	3	5. <i>Melanoplus packardii</i> -----	5
6. Five other species-----	27	6. Thirty-one other species-----	45

Grand total

<u>Percent</u>
1. <i>Melanoplus femur-rubrum</i> -----17
2. <i>Melanoplus mexicanus</i> -----16
3. <i>Melanoplus bivittatus</i> -----10
4. <i>Aeoloplus turnbullii</i> ----- 8
5. <i>Melanoplus packardii</i> ----- 5
6. Thirty-one other species---44

MICHIGAN

There are but three natural vegetation areas in Michigan--the northeastern pine forest, northeastern hardwoods, and southern hardwoods. Large portions of these areas have been denuded of their forests and in their stead there is now an abundance of stump pasture land and small farms.

No collections are recorded for the Lower Peninsula. In the Upper Peninsula 985 specimens were taken, representing 8 species in 3 environments, viz., 8 in pastures, 1 in small grain, and 3 in legumes. The infestations were light over the entire Upper Peninsula, but severe infestations were present in the northern half of the Lower Peninsula. *Melanoplus mexicanus* and *Camula ellucida* were the most important species. The general population in 1936 was about half that recorded for 1935.

The distribution by species of 985 specimens collected in the Upper Peninsula of Michigan, expressed in percentage of total number collected in each habitat, is shown in the following table.

Species	Percentage collected in---			Total specimens	% of grand total
	Pasture	Small grain	Legumes		
<i>Camnula pellucida</i> - - - - -	29.05	100	--	321	32.58
<i>Chortippus curtipennis</i> - - - - -	.56	--	2.94	6	.61
<i>Melanoplus bivittatus</i> - - - - -	.79	--	--	7	.71
<i>Melanoplus confusus</i> Scudd. - - - - -	.11	--	--	1	.10
<i>Melanoplus dawsoni</i> - - - - -	1.02	--	--	9	.94
<i>Melanoplus differentialis</i> - - - - -	.24	--	--	2	.20
<i>Melanoplus femur-rubrum</i> - - - - -	10.58	--	67.64	117	11.88
<i>Melanoplus mexicanus</i> - - - - -	57.65	--	29.42	522	52.99
Numbers collected	888	63	34	985	--

The percentages of individuals of the various species present in Michigan, arranged according to crops infested, are summarized as follows:

<u>Pasture</u>		<u>Small grain</u>	
	<u>Percent</u>		<u>Percent</u>
1. <i>Melanoplus mexicanus</i> -----	57	1. <i>Camnula pellucida</i> -----	100
2. <i>Camnula pellucida</i> -----	29		
3. <i>Melanoplus femur-rubrum</i> -----	10		
4. <i>Melanoplus dawsoni</i> -----	1		
5. <i>Melanoplus bivittatus</i> -----	1		
6. Three other species-----	2		

Grand total

	<u>Percent</u>
1. <i>Melanoplus mexicanus</i> -----	53
2. <i>Camnula pellucida</i> -----	32
3. <i>Melanoplus femur-rubrum</i> -----	12
4. <i>Melanoplus dawsoni</i> -----	1
5. <i>Melanoplus bivittatus</i> -----	1
6. Three other species-----	1

MINNESOTA

The tall-grass prairie section, which comprises the extreme western and southern portions of this State, has been the most concerned with grasshopper outbreaks. All of the collections recorded were made in the extreme northwestern counties, or Red River Valley area. Three thousand three hundred and fourteen specimens, representing 26 species, were taken from 8 crop environments, as follows: 6 in corn, 17 in small grains, 14 in legumes, 13 in flax, 21 in meadows, 12 in pastures, 21 in mixed habitats, and 15 along roadsides.

The most severe infestations were observed in northwestern Minnesota. A normal-plus infestation was used to designate a somewhat general infestation in the central, west-central, and southern counties.

Camnula pellucida and *Melanoplus bivittatus* were the most important species. *M. femur-rubrum* was the most destructive species in the southern half of the State and appears to be increasing in numbers and importance. *M. dawsoni* and *Encoptolophus costalis* Scudd. were also relatively abundant. The distribution by species of 3,314 specimens collected in the Red River Valley of Minnesota, expressed in percentage of total number collected in each habitat, is shown in the following table.

Species	Percentage collected in --							Total specimens	% of grand total	
	Corn	Small grain	Legumes	Flax	Meadow	Pasture	Mixed			Roadside
<i>Ageneotettix deorum</i>	--	0.53	--	--	3.71	4.00	3.93	0.99	84	2.53
<i>Amphitornus coloratus</i>	--	--	--	--	--	--	4.34	--	42	1.27
<i>Arphia pseudonietana</i>	--	--	--	--	1.06	.80	.41	--	15	.45
<i>Cannula pellucida</i>	44.60	16.36	12.42	10.31	25.46	32.00	17.47	40.79	752	22.69
<i>Chortippus curtippennis</i>	--	.26	--	1.78	1.48	--	.41	--	24	.72
<i>Derotema haydenii</i>	--	--	--	--	1.48	.80	--	--	15	.45
<i>Dissosteira carolina</i>	--	4.22	1.30	.71	1.17	--	2.07	16.41	117	3.53
<i>Encoptolophus costalis</i>	1.53	1.32	6.54	.36	12.20	33.60	6.20	5.22	255	7.69
<i>Hesperotettix viridis</i> Thos.	--	--	--	--	--	--	.31	--	3	.09
<i>Melanoplus angustipennis</i>	--	1.32	.65	.21	--	--	.72	1.99	23	.69
<i>Melanoplus bivittatus</i>	26.14	40.89	7.84	51.95	3.29	3.20	16.85	16.66	595	17.95
<i>Melanoplus confusus</i>	--	.26	--	--	.32	--	--	--	4	.12
<i>Melanoplus dawsoni</i>	21.53	7.38	3.27	8.18	16.34	.80	8.99	1.99	319	9.62
<i>Melanoplus femur-rubrum</i>	3.07	14.51	33.99	19.21	9.44	12.80	10.65	3.48	385	11.61
<i>Melanoplus flavidus</i>	--	--	5.88	.65	--	--	--	--	1	.03
<i>Melanoplus gladstoni</i>	--	--	--	--	.42	.80	.21	--	16	.48
<i>Melanoplus infantilis</i>	--	.52	.65	--	1.17	--	1.34	.99	31	.93
<i>Melanoplus mexicanus</i>	4.51	8.70	21.57	6.05	10.61	2.40	15.72	7.96	373	11.25
<i>Melanoplus occidentalis</i> Thos.	--	.26	--	--	--	--	.10	--	2	.06
<i>Melanoplus packardii</i>	--	1.85	1.96	.36	.11	--	.83	.99	24	.72
<i>Metobregma kiowa</i> Thos.	--	.53	1.31	.36	1.70	8.00	1.55	.25	47	1.42
<i>Metator pardalinus</i>	--	--	--	--	1.06	--	.41	.75	17	.51
<i>Opeia obscura</i>	--	--	--	--	.11	--	--	--	1	.03
<i>Orphulella pelidna</i> Burm.	--	--	--	--	.11	--	--	--	1	.03
<i>Orphulella speciosa</i> Scudd.	--	.53	.65	--	6.68	--	6.41	.25	129	3.89
<i>Spharagemon collare</i>	--	.53	1.31	.71	1.80	.80	1.03	1.24	39	1.18
Numbers collected	65	379	153	281	942	125	967	402	3,314	--

The percentages of individuals of the various species present in Minnesota, arranged according to habitat, were as follows:

<u>Corn</u>	<u>Percent</u>
1. Camnula pellucida-----	45
2. Melanoplus bivittatus-----	26
3. Melanoplus dawsoni-----	21
4. Melanoplus mexicanus-----	4
5. Melanoplus femur-rubrum-----	3
6. Encoptolophus costalis-----	1

<u>Small grain</u>	<u>Percent</u>
1. Melanoplus bivittatus-----	41
2. Camnula pellucida-----	16
3. Melanoplus femur-rubrum-----	14
4. Melanoplus mexicanus-----	9
5. Melanoplus dawsoni-----	7
6. Twelve other species-----	13

<u>Legumes</u>	
1. Melanoplus femur-rubrum-----	34
2. Melanoplus mexicanus-----	22
3. Camnula pellucida-----	12
4. Melanoplus bivittatus-----	8
5. Encoptolophus costalis-----	6
6. Ten other species-----	18

<u>Flax</u>	
1. Melanoplus bivittatus-----	52
2. Melanoplus femur-rubrum-----	19
3. Camnula pellucida-----	10
4. Melanoplus dawsoni-----	8
5. Melanoplus mexicanus-----	6
6. Six other species-----	5

<u>Meadow</u>	
1. Camnula pellucida-----	25
2. Melanoplus dawsoni-----	16
3. Encoptolophus costalis-----	12
4. Melanoplus mexicanus-----	11
5. Melanoplus femur-rubrum-----	9
6. Seventeen other species-----	27

<u>Pasture</u>	
1. Encoptolophus costalis-----	34
2. Camnula pellucida-----	32
3. Melanoplus femur-rubrum-----	13
4. Mestobregma kiowa-----	8
5. Ageneotettix deorum-----	4
6. Seven other species-----	9

<u>Mixed</u>	
1. Camnula pellucida-----	17
2. Melanoplus bivittatus-----	17
3. Melanoplus mexicanus-----	16
4. Melanoplus femur-rubrum-----	11
5. Melanoplus dawsoni-----	9
6. Sixteen other species-----	30

<u>Roadside</u>	
1. Camnula pellucida-----	41
2. Melanoplus bivittatus-----	17
3. Dissosteira carolina-----	16
4. Melanoplus mexicanus-----	8
5. Encoptolophus costalis-----	5
6. Ten other species-----	13

Grand total

	<u>Percent</u>
1. Camnula pellucida-----	23
2. Melanoplus bivittatus-----	18
3. Melanoplus femur-rubrum-----	12
4. Melanoplus mexicanus-----	11
5. Melanoplus dawsoni-----	10
6. Twenty-one other species-----	26

MONTANA

The three natural vegetation areas of this State are the short-grass, foothill, and mountain areas. Most of the localities troubled by grasshoppers are in the eastern two-thirds of the State, which is largely the short-grass area. The chief crop is wheat, with large grazing tracts. In the farming sections there is always an abundance of idle or abandoned land which is considered as a habitat when making grasshopper collections or studies of grasshopper populations.

There were 9,616 specimens, representing 46 species, collected in 11 habitats, viz., 30 in small grain, 23 in alfalfa and sweetclover, 37 on plains grasslands, 18 in low-mountain grasslands, 16 in sagebrush flats, 19 in native pastures, 25 in coulee bottoms, 9 in timothy hay, 29 along the roadsides, and 30 in the reversion and idle lands.

Melanoplus mexicanus was dominant in the State, with Aulocara ellioti second in importance. The most notable change was the great increase in abundance of A. ellioti which, in the range lands, came from fourth place at 10 percent in 1935, to first place at 28 percent of the total number of specimens collected in 1936. On the other hand, Cordillacris cremulata Brun., which held first place on the range in 1935 at 15 percent, dropped to eighth place at 3 percent. Amphitornus coloradus is another species that decreased greatly.

The most severe infestations were scattered all through the eastern two-thirds of the State, except for the north-central part, where local infestations occurred. Along the Yellowstone Valley and east of Billings heavy adult populations in July and August seemed to disappear suddenly in August, leaving no eggs. On the Huntley study area near Billings, the number of egg pods averaged eight per square foot in alfalfa and three in small grain in 1935. In 1936 there were more adults than in 1935; however, the egg counts in the egg survey of 1936, showed an average of only 0.13 per square foot in alfalfa and 0.07 in the small grain.

During the severe outbreaks grasshoppers tend to increase in numbers far beyond the carrying capacity of the plant food in a unit area. This causes a high mortality, which reduces the population to below the carrying capacity. Other factors, such as heat and drought, directly or indirectly help in this reduction by incapacitating the hoppers or fixing the carrying capacity at much lower levels than normal. The distribution by species of 9,616 individuals collected in Montana, expressed in total number taken in each habitat, is shown in the following table.

Species

Species	Percentage collected in --										Total speci- mens	% of grand total
	Small grain	Alfalfa and sweet clover	Plains grass- land	Low Mt. grass- land	Sage- brush	Pas- ture	Cou- lee bot- tom	Time- thy	Road- side	Rever- sion		
Aeoloplus turnbullii - - -	0.17	0.19	0.48	--	17.59	0.52	0.25	--	1.93	--	123	1.27
Aerochoreutes carlinianus Thos.	.13	.13	.41	--	--	--	--	--	.08	.07	13	.13
Ageneotettix deorum - - -	1.58	1.42	16.24	5.53	7.72	6.00	20.17	2.37	3.47	4.24	553	5.75
Amphitornus coloradus - - -	.13	.06	2.02	.37	.21	.26	.49	3.16	.96	.07	59	.61
Arphia pseudonietana - - -	--	--	.07	.74	--	--	--	--	--	--	3	.03
Aulocara ellioti - - -	10.18	2.20	27.81	11.31	23.17	12.00	26.32	8.69	17.10	6.91	1285	13.36
Camula pellucida - - -	6.80	10.87	3.27	8.86	12.23	20.09	1.72	20.14	10.08	.96	724	7.53
Chortippus curtipennis - - -	.04	.06	--	--	--	6.26	--	--	--	--	26	.27
Cordillacris crenulata Brun.	--	--	2.99	--	--	--	1.72	--	.32	.14	56	.58
Cordillacris occipitalis Thos.	--	--	.20	--	--	--	--	--	--	--	3	.03
Cratypedes neglectus Thos.	.04	--	.07	--	--	--	--	--	--	--	2	.02
Derotmema haydenii - - -	.04	.06	.07	--	--	--	.49	--	.24	.29	12	.12
Dissosteira carolina - - -	1.75	.97	.34	1.11	--	--	25.00	--	.64	.59	80	.83
Drepanopterna femoratum - - -	.03	--	2.16	--	.85	2.35	4.43	--	.56	.44	77	.80
Encoptolophus costalis - - -	.08	.06	.06	--	--	--	--	--	.08	.14	7	.07
Gomphocerus clavatus Thos.	--	.06	.06	--	--	--	--	--	--	--	2	.02
Hadrotettix trifasciatus - - -	.17	.06	.83	1.47	--	--	--	--	--	.22	24	.24
Hesperotettix viridis - - -	.13	--	1.25	--	4.50	--	.74	--	.16	.29	51	.53
Hypochlora alba - - -	.04	--	.13	2.21	--	--	1.72	--	--	--	16	.16
Melanoplus angustipennis - - -	--	.19	--	--	--	--	.49	--	.08	1.26	23	.23
Melanoplus bivittatus - - -	5.79	4.79	--	6.64	1.92	7.83	.74	5.13	4.11	.74	340	3.53
Melanoplus bowditchi - - -	--	--	.56	--	5.57	.26	3.44	--	--	1.04	63	.65
Melanoplus confusus - - -	.35	--	.14	--	4.29	2.61	--	--	.16	.44	48	.49
Melanoplus dawsoni - - -	--	.52	--	.37	--	--	--	--	.16	--	11	.11
Melanoplus femur-rubrum - - -	7.86	24.45	.20	8.86	2.14	--	.74	1.97	9.21	3.57	764	7.94
Melanoplus flavidus - - -	--	--	--	--	1.07	.26	--	--	--	--	6	.06
Melanoplus gladstoni - - -	.08	.06	.14	--	--	--	.47	--	.16	.52	16	.16
Melanoplus infantilis - - -	1.79	.77	10.03	5.17	--	.52	2.70	4.34	3.79	2.90	321	3.34
Melanoplus mexicanus - - -	54.96	48.72	10.03	41.69	15.23	36.01	19.43	52.14	33.57	59.52	3898	40.54
Melanoplus occidentalis - - -	.08	.06	6.06	1.47	1.71	1.04	1.97	--	1.61	.22	137	1.42
Melanoplus packardii - - -	6.14	3.62	2.85	1.85	1.28	2.87	7.87	1.97	7.26	12.05	548	5.69
Mermiria maculipennis - - -	--	.06	.76	--	--	--	--	--	--	--	12	.12
Metobregma kiowa - - -	.26	--	6.83	1.11	--	.26	.25	--	.56	.52	122	1.26
Metator pardalinus - - -	.36	--	.07	.37	--	.26	--	--	2.98	1.04	62	.64

Species	Percentage collected in --										% of grand total
	Alfalfa and sweet clover	Plains grass-land	Low Mt. Grass-land	Sage brush	Pas-ture	Cou-lee bot-tom	Timor-thy	Road-side	Rever-sion	Total speci-mens	
<i>Opeia obscura</i> - - - - -	--	0.07	--	--	--	0.25	--	0.16	--	4	.04
<i>Orphulella pelidna</i> - - - - -	--	--	--	--	0.26	--	--	.08	--	2	.02
<i>Orphulella speciosa</i> - - - - -	0.09	.07	--	--	--	--	--	--	--	3	.03
<i>Philobostroma quadrimaculatum</i> - - - - -	--	2.50	--	--	--	--	--	--	--	36	.37
<i>Phoetaliotes nebrascensis</i> Thos. - - - - -	.05	.06	--	--	--	1.47	--	--	.07	9	.09
<i>Schistocerca lineata</i> Scudd. - - - - -	--	.06	--	--	--	1.23	--	--	--	6	.06
<i>Spharagemon collare</i> - - - - -	.39	.06	--	.42	.26	.47	--	.16	.59	32	.33
<i>Spharagemon equale</i> - - - - -	.27	.69	.37	--	--	--	--	.08	.59	26	.27
<i>Trimerotropis pestrinaria</i> Sams. - - - - -	--	.07	--	--	--	--	--	--	--	1	.01
<i>Trimerotropis campestris</i> - - - - -	--	.07	--	--	--	--	--	.08	.07	3	.03
<i>Trimerotropis pallidipennis</i> - - - - -											
Burn. - - - - -	.04	--	--	--	--	--	--	--	.14	4	.04
<i>Trimerotropis sparsa</i> Thos. - - - - -	--	--	--	--	--	--	--	--	.22	3	.03
Numbers collected - - - - -	2,276	1,434	271	466	383	406	253	1,238	1,344	9,616	--

The percentages of individuals of the various species present in Montana, arranged according to habitat, were as follows:

Small grain

Percent

1. <i>Melanoplus mexicanus</i> -----	55
2. <i>Aulocara ellioti</i> -----	10
3. <i>Melanoplus femur-rubrum</i> -----	8
4. <i>Camnula pellucida</i> -----	7
5. <i>Melanoplus packardii</i> -----	6
6. Twenty-five other species----	14

Plains grassland

1. <i>Aulocara ellioti</i> -----	28
2. <i>Ageneotettix deorum</i> -----	16
3. <i>Melanoplus mexicanus</i> -----	10
4. <i>Melanoplus infantilis</i> -----	10
5. <i>Mestobregma kiowa</i> -----	7
6. Thirty-six other species----	29

Sagebrush

1. <i>Aulocara ellioti</i> -----	23
2. <i>Aeoloplus turnbullii</i> -----	18
3. <i>Melanoplus mexicanus</i> -----	15
4. <i>Camnula pellucida</i> -----	12
5. <i>Ageneotettix deorum</i> -----	8
6. Eleven other species-----	24

Coulee bottom

1. <i>Aulocara ellioti</i> -----	26
2. <i>Ageneotettix deorum</i> -----	20
3. <i>Melanoplus mexicanus</i> -----	19
4. <i>Drepanopterna femoratum</i> -----	4
5. <i>Melanoplus packardii</i> -----	8
6. Twenty other species-----	23

Roadside

1. <i>Melanoplus mexicanus</i> -----	34
2. <i>Aulocara ellioti</i> -----	17
3. <i>Camnula pellucida</i> -----	10
4. <i>Melanoplus femur-rubrum</i> -----	9
5. <i>Melanoplus packardii</i> -----	7
6. Twenty-four other species----	23

Legumes

Percent

1. <i>Melanoplus mexicanus</i> -----	49
2. <i>Melanoplus femur-rubrum</i> -----	24
3. <i>Camnula pellucida</i> -----	11
4. <i>Melanoplus bivittatus</i> -----	5
5. <i>Melanoplus packardii</i> -----	4
6. Nineteen other species-----	7

Low-mountain grassland

1. <i>Melanoplus mexicanus</i> -----	42
2. <i>Aulocara ellioti</i> -----	12
3. <i>Camnula pellucida</i> -----	9
4. <i>Melanoplus femur-rubrum</i> -----	9
5. <i>Melanoplus bivittatus</i> -----	7
6. Thirteen other species-----	21

Pasture

1. <i>Melanoplus mexicanus</i> -----	36
2. <i>Camnula pellucida</i> -----	20
3. <i>Aulocara ellioti</i> -----	12
4. <i>Melanoplus bivittatus</i> -----	8
5. <i>Chortippus curtippennis</i> -----	6
6. Fourteen other species-----	18

Timothy

1. <i>Melanoplus mexicanus</i> -----	52
2. <i>Camnula pellucida</i> -----	20
3. <i>Aulocara ellioti</i> -----	9
4. <i>Melanoplus bivittatus</i> -----	5
5. <i>Melanoplus infantilis</i> -----	4
6. Four other species-----	10

Reversion

1. <i>Melanoplus mexicanus</i> -----	60
2. <i>Melanoplus packardii</i> -----	12
3. <i>Aulocara ellioti</i> -----	7
4. <i>Ageneotettix deorum</i> -----	4
5. <i>Melanoplus femur-rubrum</i> -----	3
6. Twenty-five other species----	14

Grand total

Percent

1. <i>Melanoplus mexicanus</i> -----	41
2. <i>Aulocara ellioti</i> -----	13
3. <i>Melanoplus femur-rubrum</i> -----	8
4. <i>Camnula pellucida</i> -----	7
5. <i>Ageneotettix deorum</i> -----	6
6. Forty-one other species-----	25

NORTH DAKOTA

There are two natural vegetation areas in this State, the tall grass and short grass. Most of the collections came from the western half or short-grass area.

There were 9,972 specimens taken from 8 habitats and these represented 36 species, viz., 14 in corn, 25 in small grain, 16 in alfalfa and sweetclover, 17 in flax, 24 in range lands, 20 in coulees, 19 in idle and reverted lands, and 33 from along roadsides.

The most severe infestations occurred in the western half of the State. Other severe outbreaks occurred in the north-central part and the southeastern quarter.

Melanoplus mexicanus in North Dakota reached its greatest importance in relation to other species from the standpoint of numbers. It was the most important grasshopper in all crops forming over half (54 percent) of the 9,972 specimens collected. From 60 to 70 percent of the hoppers in small grain, alfalfa, and flax were of this species. Only on the range land was it second in importance, for here Ageneotettix deorum was dominant and three times as numerous as M. mexicanus. In reverted or idle lands M. mexicanus formed 59 percent of the population. This has been observed before, both here and in Montana, and bears out the fact that these are good habitats for this particular species. This species has increased its dominancy in crops over other species, and A. deorum has done the same on range lands. This would indicate that these two species are better able to withstand drought. Phlibostroma quadrimaculatum Those a common species, and others had fallen off in numbers.

The distribution by species of 9,972 individuals collected in North Dakota expressed in percentage of total number taken in each habitat, is shown in the following table.

Species	Corn	Small grains	Alfalfa and sweet clover	Flax	Range	Coulee	Rever-sion	Road-side	Total speci-mens	% of grand total
<i>Aeoloplus turnbulli</i> - - -	--	0.76	--	1.41	--	--	--	0.92	9.53	0.53
<i>Ageneotettix deorum</i> - - -	1.63	8.72	3.94	1.13	46.77	50.13	15.95	9.52	1522	15.26
<i>Amphitornus coloradus</i> - - -	--	.06	--	.28	.51	--	--	.12	10	.10
<i>Aulocara elliotti</i> - - - -	.81	2.47	.46	.56	4.36	14.79	2.34	2.12	319	3.19
<i>Camula pellucida</i> - - - -	3.27	1.46	5.92	3.39	.25	.52	.07	1.08	149	1.49
<i>Derotmema haydenii</i> - - -	--	.03	--	--	.12	--	.07	.04	4	.04
<i>Dissosteira carolina</i> - - -	3.27	2.74	1.16	2.54	.12	.52	1.66	1.28	172	1.72
<i>Drepanopterna femoratum</i> - -	--	--	--	--	.51	.13	--	1.08	32	.32
<i>Encyptolophus costalis</i> - -	--	.18	--	--	.12	.78	--	.04	14	.14
<i>Hadrotettix trifasciatus</i> -	.81	.15	--	.28	1.15	--	.30	.56	34	.34
<i>Hesperotettix speciosus</i>	--	--	--	--	--	--	--	--	--	--
<i>Scudd.</i> - - - - - - - - -	--	--	--	.28	.12	.91	--	.04	10	.10
<i>Hesperotettix viridis</i> - - -	--	--	--	--	.28	--	.07	.32	11	.11
<i>Hypochlora alba</i> - - - - -	--	--	--	--	--	--	--	.04	1	.01
<i>Melanoplus angustipennis</i>	2.45	2.37	3.59	.28	--	--	6.65	7.44	387	3.87
<i>Melanoplus bivittatus</i> - - -	23.76	.79	1.74	6.23	.12	.65	.75	3.48	195	1.95
<i>Melanoplus bowditchi</i> - - -	--	--	--	--	--	--	--	.04	1	.01
<i>Melanoplus confusus</i> - - - -	--	.03	--	--	--	--	--	--	1	.01
<i>Melanoplus dawsoni</i> - - - -	--	--	.23	--	.12	.52	--	.04	9	.09
<i>Melanoplus differentialis</i>	.81	.33	.23	--	--	--	--	.24	20	.20
<i>Melanoplus femur-rubrum</i> -	9.01	2.34	6.14	8.21	.38	.91	1.36	7.00	373	3.73
<i>Melanoplus flavidus</i> - - - -	--	--	--	--	--	--	--	.04	1	.01
<i>Melanoplus gladstoni</i> - - -	--	.73	.46	.28	.38	.13	.30	.68	54	.54
<i>Melanoplus infantilis</i> - - -	--	1.70	.34	--	9.38	3.92	2.42	.68	211	2.11
<i>Melanoplus mexicanus</i> - - -	44.25	66.45	68.21	70.82	16.19	18.84	59.11	52.36	5432	54.43
<i>Melanoplus occidentalis</i> -	--	--	--	--	.51	.26	--	--	6	.06
<i>Melanoplus packardii</i> - - -	6.55	6.89	5.68	2.54	3.85	3.40	7.56	6.64	614	6.15
<i>Mermiria maculipennis</i> - - -	--	--	--	--	--	--	--	.08	2	.02
<i>Mestobregma kiowa</i> Thos. -	--	.42	.46	.56	5.65	.26	.60	.44	85	.85
<i>Metator pardalinus</i> - - - -	.81	.15	11.00	--	--	--	--	.76	26	.26
<i>Opeia obscura</i> - - - - - -	--	--	--	--	.89	--	--	.20	12	.12
<i>Orphulella speciosa</i> - - - -	--	--	--	--	.12	.39	--	.08	6	.06
<i>Phlibostroma quadrimaculatum</i> - - - - - - - - -	--	.03	--	.28	7.83	.13	.07	.52	78	.78

Species	Percentage collected in --								Total speci- mens	% of grand total
	Corn	Small grains	Alfalfa and sweet clover	Flax	Range	Coulee	Rever- sion	Road- side		
Phoetaliotes netrascensis	--	0.09	--	--	--	2.61	0.07	0.64	40	0.40
Spharagemon collare --	1.53	.54	1.27	.84	--	.13	.52	1.04	68	.58
Spharagemon equale --	.81	.30	--	--	.12	--	.07	.24	19	.19
Trimerotropis campestris-	--	.06	--	--	--	--	--	--	2	.02
Numbers collected --	122	3,275	862	353	778	764	1,323	2,495	3,972	--

The percentages of individuals of the various species present in North Dakota, arranged according to habitat, were as follows:

Corn

Percent

1. *Melanoplus mexicanus*-----44
2. *Melanoplus bivittatus*-----24
3. *Melanoplus femur-rubrum*----- 9
4. *Melanoplus packardii*----- 7
5. *Dissosteira carolina*----- 3
6. Nine other species-----13

Small grain

Percent

1. *Melanoplus mexicanus*-----66
2. *Ageneotettix deorum*----- 9
3. *Melanoplus packardii*----- 7
4. *Dissosteira carolina*----- 3
5. *Aulocara ellioti*----- 2
6. Twenty other species-----13

Legumes

1. *Melanoplus mexicanus*-----68
2. *Melanoplus femur-rubrum*----- 6
3. *Camnula pellucida*----- 6
4. *Melanoplus packardii*----- 6
5. *Ageneotettix deorum*----- 4
6. Eleven other species-----10

Flax

1. *Melanoplus mexicanus*-----71
2. *Melanoplus femur-rubrum*----- 8
3. *Melanoplus bivittatus*----- 6
4. *Camnula pellucida*----- 3
5. *Melanoplus packardii*----- 2
6. Twelve other species-----10

Range

1. *Ageneotettix deorum*-----47
2. *Melanoplus mexicanus*-----16
3. *Melanoplus infantilis*----- 9
4. *Phlibostroma quadrimaculatum*-- 8
5. *Mestobregma kiowa*----- 6
6. Nineteen other species-----14

Coulee

1. *Ageneotettix deorum*-----50
2. *Melanoplus mexicanus*-----19
3. *Aulocara ellioti*-----15
4. *Melanoplus infantilis*----- 4
5. *Melanoplus packardii*----- 3
6. Fifteen other species----- 9

Reversion

1. *Melanoplus mexicanus*-----59
2. *Ageneotettix deorum*-----16
3. *Melanoplus packardii*----- 8
4. *Melanoplus angustipennis*----- 7
5. *Melanoplus infantilis*----- 2
6. Fourteen other species----- 8

Roadside

1. *Melanoplus mexicanus*-----52
2. *Ageneotettix deorum*----- 9
3. *Melanoplus angustipennis*----- 7
4. *Melanoplus femur-rubrum*----- 7
5. *Melanoplus packardii*----- 7
6. Twenty-eight other species----18

Grand total

Percent

1. *Melanoplus mexicanus*-----54
2. *Ageneotettix deorum*-----15
3. *Melanoplus packardii*----- 6
4. *Melanoplus angustipennis*----- 4
5. *Melanoplus femur-rubrum*----- 4
6. Thirty-one other species-----17

SOUTH DAKOTA

Most of the collections in this State were made in the short-grass area. There were 5,122 specimens taken in 7 environments, with 39 species represented viz., 21 in corn, 27 in small grain, 35 on range land, 22 in legumes, 23 in pastures and hay meadows, 5 in flax, and 10 from roadsides.

Very little can be said regarding the locations of the infestations as the whole State was subjected to extreme heat and drought, which reduced egg deposition enormously, close to 100 percent in many places. During the adult survey in July and August infestations were general and severe. In 36 counties no eggs were found in the egg survey and all counties averaged under 10 percent

Melanoplus mexicanus was the most numerous in all crops, also on the range and in the pastures. It constituted 48 percent of the total number of specimens collected in the State. M. femur-rubrum was second, M. differentialis third, and Ageneotettix deorum fourth. In 1935, A. deorum and Mestobrama klion were the two most important species on the range and in the pastures. They have been superseded by M. mexicanus in these habitats, which has increased its lead over the others. Phlibostroma quadrimaculatum and Amphitornus coloratus, with others, have decreased where, in 1935, they were among the first five species in numbers in some of the habitats. The distribution by species of 5,122 individuals collected in South Dakota, expressed in percentage of the total number taken in each habitat, is shown in the following table.

Species	Corn	Small grains	Range	Leg-umes	Pasture & hay meadow	Flax	Road-side	specimens	grand total
Aeoloplus turnbullii	0.40	0.76	0.90	--	--	--	--	28	0.54
Ageneotettix deorum	10.05	4.33	14.95	7.89	15.94	1.76	2.09	488	9.52
Amphitornus coloradus	--	--	.26	.10	1.91	--	--	12	.23
Arphia pseudonietana	.20	.14	.06	.30	1.61	1.76	--	14	.27
Aulocara elliotti	1.00	1.53	5.36	.80	1.10	--	1.05	124	2.42
Bruneria brunnea Thos.	--	--	--	--	1.91	--	--	7	.13
Cannula pellucida	1.81	.19	.06	.20	3.54	--	--	28	.55
Chortippus cordillacris Harr.	--	.06	.26	.19	--	--	--	7	.13
Derotmema haydenii	.40	1.21	1.50	.29	--	--	--	47	.91
Dissosteira carolina	.61	.64	.39	.09	.54	3.51	1.05	25	.49
Drepanopterna femoratum	--	.14	3.58	--	2.46	--	--	66	1.29
Encoptolophus costalis	--	.14	--	.19	1.64	--	--	10	.20
Hadrotettix trifasciatus	--	.25	.46	--	.27	--	4.17	16	.32
Hesperotettix viridis	.61	.25	.46	--	--	--	--	14	.28
Hypochochloa alba	--	--	.12	--	--	--	--	2	.04
Melanoplus angustipennis	2.02	--	.20	3.70	3.54	--	2.09	6	.12
Melanoplus bivittatus	4.84	1.08	1.76	2.39	4.15	--	--	109	2.11
Melanoplus bowditchi	--	.14	.20	--	--	--	--	5	.10
Melanoplus confusus	--	.25	--	--	--	--	--	4	.08
Melanoplus differentialis	27.74	.76	4.83	3.00	8.40	--	--	285	5.56
Melanoplus femur-rubrum	5.23	16.31	4.50	25.97	.84	36.84	--	635	12.39
Melanoplus flavidus	--	--	--	.09	--	--	--	1	.02
Melanoplus foedus Scudd.	1.42	1.08	3.72	.40	--	--	--	81	1.58
Melanoplus gladstoni	--	.65	.12	--	--	--	--	16	.32
Melanoplus infantilis	.61	.33	.97	--	--	--	--	24	.47
Melanoplus lakinus	--	.19	.72	--	--	--	--	14	.27
Melanoplus mexicanus	35.78	58.67	46.30	49.25	17.29	56.13	62.46	2457	47.97
Melanoplus occidentalis	--	2.17	.46	--	--	--	--	41	.80
Melanoplus packardii	2.82	5.22	1.63	.69	1.08	--	10.41	142	2.77
Melanoplus spp. (nymphs)	.20	1.40	.72	1.00	1.35	--	7.29	56	1.10
Mexirria maculipennis	--	--	.12	--	2.16	--	--	10	.20
Mestobregma kiowa	1.62	--	1.24	1.10	10.00	--	1.04	76	1.49
Metator pardalinus	.61	--	.12	.80	.54	--	--	15	.30
Opeia obscura	--	--	.12	--	.54	--	--	2	.04
Orphulella speciosa	--	--	.12	--	3.24	--	--	13	.25
Philibostroma quadrimaculatum	--	--	1.37	--	--	--	--	23	.45
Phoetaliotes nebrascensis	.61	.39	.20	.18	14.58	--	--	68	1.34
Schiostocerca lineata	--	--	.06	--	1.35	--	--	1	.02
Spharagemon collare	1.02	1.15	.33	1.29	--	--	8.35	54	1.05
Spharagemon equale	.40	.52	1.83	.09	--	--	--	39	.76
Numbers collected	497	1,569	1,532	1001	370	57	96	5,122	--

The percentages of individuals of the various species present in South Dakota arranged according to habitat, were as follows:

Corn

Percent

1. <i>Melanoplus mexicanus</i> -----	36
2. <i>Melanoplus differentialis</i> -----	27
3. <i>Ageneotettix deorum</i> -----	10
4. <i>Melanoplus femur-rubrum</i> -----	5
5. <i>Melanoplus bivittatus</i> -----	4
6. Seventeen other species-----	18

Range

1. <i>Melanoplus mexicanus</i> -----	46
2. <i>Ageneotettix deorum</i> -----	15
3. <i>Aulocara ellioti</i> -----	5
4. <i>Melanoplus differentialis</i> -----	4
5. <i>Melanoplus femur-rubrum</i> -----	4
6. Thirty-one other species-----	26

Pasture

1. <i>Melanoplus mexicanus</i> -----	17
2. <i>Ageneotettix deorum</i> -----	16
3. <i>Phoetaliotes nebrascensis</i> -----	14
4. <i>Mestobregma kiowa</i> -----	10
5. <i>Melanoplus differentialis</i> -----	8
6. Nineteen other species-----	35

Roadside

1. <i>Melanoplus mexicanus</i> -----	62
2. <i>Melanoplus packardii</i> -----	10
3. <i>Spharagema collaris</i> -----	8
4. <i>Melanoplus</i> spp. (nymphs)-----	7
5. <i>Hadrotettix trifasciatus</i> -----	4
6. Five other species-----	9

Small grain

Percent

1. <i>Melanoplus mexicanus</i> -----	58
2. <i>Melanoplus femur-rubrum</i> -----	16
3. <i>Melanoplus packardii</i> -----	5
4. <i>Ageneotettix deorum</i> -----	4
5. <i>Aulocara ellioti</i> -----	1
6. Twenty-three other species-----	16

Legumes

1. <i>Melanoplus mexicanus</i> -----	49
2. <i>Melanoplus femur-rubrum</i> -----	26
3. <i>Ageneotettix deorum</i> -----	8
4. <i>Melanoplus angustipennis</i> -----	4
5. <i>Melanoplus differentialis</i> -----	3
6. Eighteen other species-----	10

Flax

1. <i>Melanoplus mexicanus</i> -----	56
2. <i>Melanoplus femur-rubrum</i> -----	36
3. <i>Dissosteira carolina</i> -----	4
4. <i>Arphia pseudonietana</i> -----	2
5. <i>Aeoloplus turnbullii</i> -----	2

Grand total

1. <i>Melanoplus mexicanus</i> -----	48
2. <i>Melanoplus femur-rubrum</i> -----	12
3. <i>Ageneotettix deorum</i> -----	9
4. <i>Melanoplus differentialis</i> -----	5
5. <i>Melanoplus packardii</i> -----	3
6. Thirty-five other species-----	23

UTAH

This State lies in the northern desert-shrub area, with mostly irrigated farms. Alfalfa is one of the principal crops. In Utah 3,572 specimens were collected in 5 habitats, representing between 35 and 40 species. Several species of Trimerotropis were lumped together because their identity was not certain. Of the species collected, 27 were taken in alfalfa, 30 in mixed habitats, 15 on the range, 10 in small grains, and 16 in meadows.

The most severe infestations were found in the north-central part of the state. In most areas the populations had increased considerably over those of 1935. The most numerous species was Melanoplus femur-rubrum, with M. mexicanus second, M. packardii third, and Aulocara ellioti fourth. In 1935, M. mexicanus was first, with M. femur-rubrum second, but in 1936 their positions were changed. Trimerotropis vincolata Scudd. was third in numbers in 1935, at 17 percent of the total number of specimens collected for the State. In 1936, it declined to only 0.72 percent of the total. A. ellioti increased from 0.64 percent in 1935 to 7.94 percent in 1936. The distribution by species of 3,572 individuals collected in Utah, expressed in percentage of total number taken in each habitat, is shown in the following table.

Species	Percentage collected in --				Total specimens	% of grand total
	Leg-umes	Mixed	Range	Small grain	Meadow	
Aeoloplus tenuipennis Scudd.	--	0.07	--	--	--	0.03
Aeoloplus turnbullii	0.53	0.92	--	--	--	0.56
Ageneotettix deorum	0.26	0.20	--	--	--	0.17
Amphitornus coloradus	--	0.59	--	--	--	0.25
Arphia pseudonietana	0.35	0.26	--	1.06	--	0.25
Aulocara eliotti	3.15	15.24	8.84	--	0.47	7.94
Camula pellucida	1.14	3.22	3.40	8.34	17.16	5.18
Chortippus curtippennis	1.14	0.26	--	--	4.68	1.32
Circotettix undulatus Rehn	--	--	--	--	0.78	0.14
Conocephalus sp.	0.79	1.77	--	--	27.92	6.02
Cordillacris occipitalis	--	--	--	--	0.16	.03
Cratypedes neglectus	0.17	--	--	--	--	.06
Derotema haydenii	--	0.33	4.08	--	0.16	0.34
Dissosteira carolina	1.58	1.71	1.37	3.12	0.94	1.54
Dissosteira spurcata Sauss.	0.17	0.53	11.56	--	--	0.76
Hesperotettix viridis	0.70	0.59	2.04	--	--	0.62
Melanoplus bivittatus	9.03	6.90	11.56	6.26	4.20	7.25
Melanoplus confusus	0.09	--	--	--	--	0.03
Melanoplus dawsoni	--	0.07	--	--	--	0.03
Melanoplus differentialis	--	0.07	--	--	--	0.03
Melanoplus femur-rubrum	26.29	29.37	17.68	19.78	34.32	28.45
Melanoplus keeleri Thos.	--	0.59	--	--	--	0.25
Melanoplus mexicanus	26.73	16.23	4.08	22.89	3.90	17.44
Melanoplus packardii	19.98	14.85	3.40	22.89	1.25	13.69
Mermiria maculipennis	0.18	0.20	--	--	--	0.42
Mestobregma kiowa Thos.	0.53	0.20	--	1.06	0.62	0.39
Mestobregma plattei Thos.	2.02	2.10	0.69	10.42	2.81	2.07
Orphulella speciosa	--	--	--	--	0.47	0.08
Schistocerca lineata	0.53	0.39	--	--	--	0.34
Spharagemon collare	1.40	1.12	--	--	0.16	0.95
Spharagemon equale	0.26	0.07	--	--	--	0.11
Trimerotropis agrestis McNeill	0.26	--	1.37	--	--	0.14
Trimerotropis laticincta	0.61	1.18	25.84	--	--	1.76
Trimerotropis pallidipennis	0.79	0.26	0.69	4.18	--	0.50
Trimerotropis vinctulata Scudd.	1.23	0.46	3.40	--	--	0.72
Trimerotropis sp.	0.09	0.25	--	--	--	0.14
Numbers collected	1,141	1,522	147	96	341	--

The percentages of individuals of the various species present in Utah, arranged according to habitat, were as follows:

Legumes

Percent

1. <i>Melanoplus mexicanus</i> -----	27
2. <i>Melanoplus femur-rubrum</i> -----	26
3. <i>Melanoplus packardii</i> -----	20
4. <i>Aulocara ellioti</i> -----	3
5. <i>Dissosteira carolina</i> -----	2
6. Twenty-two other species-----	22

Mixed

Percent

1. <i>Melanoplus femur-rubrum</i> -----	29
2. <i>Melanoplus mexicanus</i> -----	16
3. <i>Aulocara ellioti</i> -----	15
4. <i>Melanoplus packardii</i> -----	14
5. <i>Melanoplus bivittatus</i> -----	7
6. Twenty-five other species-----	19

Range

1. <i>Trimerotropis laticincta</i> -----	25
2. <i>Melanoplus femur-rubrum</i> -----	17
3. <i>Melanoplus bivittatus</i> -----	11
4. <i>Dissosteira spurcata</i> -----	11
5. <i>Aulocara ellioti</i> -----	8
6. Ten other species-----	28

Small grain

1. <i>Melanoplus mexicanus</i> -----	23
2. <i>Melanoplus packardii</i> -----	23
3. <i>Melanoplus femur-rubrum</i> -----	19
4. <i>Mestobregma plattei</i> -----	10
5. <i>Camnula pellucida</i> -----	8
6. Five other species-----	17

Meadow

1. <i>Melanoplus femur-rubrum</i> -----	34
2. <i>Conocephalus sp.</i> -----	28
3. <i>Camnula pellucida</i> -----	17
4. <i>Chortippus curtippennis</i> -----	5
5. <i>Melanoplus bivittatus</i> -----	4
6. Eleven other species-----	12

Grand total

1. <i>Melanoplus femur-rubrum</i> -----	28
2. <i>Melanoplus mexicanus</i> -----	17
3. <i>Melanoplus packardii</i> -----	13
4. <i>Aulocara ellioti</i> -----	8
5. <i>Melanoplus bivittatus</i> -----	7
6. Thirty-one other species-----	27

WISCONSIN

The northeastern pine and northeastern and southern hardwood areas comprise most of this State. There are many cut-over stump pastures and hay meadows. With the exception of two spots, one in Ashland and one in Waupaga County, the most severe infestations were confined to the southern three tiers of counties. Heavy infestations of *Melanoplus femur-rubrum* and *M. mexicanus* developed in these counties. Considerable difficulty was encountered in finding eggs during the egg survey and it is believed that the heavy rains in the latter part of the summer checked the infestations.

M. femur-rubrum, at 65 percent, constituted two-thirds of the specimens collected in the State. *M. mexicanus* was second, at 31 percent. Twelve other species together made up the remainder at 4 percent. The numbers of nymphs of *M. femur-rubrum* ran as high as from 70 to 80 per square yard in July and serious damage was done to second cuttings and new seedlings of alfalfa. From 1935 to 1936, *M. mexicanus* has reduced the lead that *M. femur-rubrum* had over it from 71 percent, in 1935, to 34 percent in 1936. The following table shows the distribution by species of 3,628 individuals taken in Wisconsin, expressed in percentage of the total number taken in each habitat.

Species	Percentage collected in --				Total speci- mens	% of grand total
	Pasture	Legumes	Roadside	Soy beans		
Ageneotettix deorum - - - - -	--	0.15	--	2.47	6	0.18
Camula pellucida - - - - -	5.34	.33	--	--	51	1.40
Chortippus curtippennis - - - - -	.76	--	--	--	6	.18
Dissosteira carolina - - - - -	--	.04	--	--	1	.03
Hesperotettix viridis - - - - -	.13	--	--	--	1	.03
Melanoplus bivittatus - - - - -	.38	.29	--	--	11	.30
Melanoplus dawsoni - - - - -	2.03	--	--	--	16	.44
Melanoplus femur-rubrum - - - - -	43.63	73.57	--	17.28	2,367	65.25
Melanoplus keeleri luridus Thos. - - - - -	--	.18	--	--	5	.14
Melanoplus mexicanus - - - - -	47.73	23.97	100	80.25	1,125	30.46
Metobregma kiowa Thos. - - - - -	--	.62	--	--	17	.47
Orphulella speciosa - - - - -	--	.62	--	--	17	.47
Schistocerca lineata - - - - -	--	.07	--	--	2	.06
Spharagemon collare - - - - -	--	.16	--	--	3	.08
Numbers collected - - - - -	786	2,731	50	81	3,628	--

The percentages of individuals of the various species present in Wisconsin, arranged according to habitat, were as follows:

<u>Pasture</u>		<u>Legumes</u>	
	<u>Percent</u>		<u>Percent</u>
1. <i>Melanoplus mexicanus</i> -----	48	1. <i>Melanoplus femur-rubrum</i> -----	74
2. <i>Melanoplus femur-rubrum</i> -----	43	2. <i>Melanoplus mexicanus</i> -----	24
3. <i>Cammula pellucida</i> -----	5	3. <i>Orphulella speciosa</i> -----	1
4. <i>Melanoplus dawsoni</i> -----	2	4. <i>Mestobregma kiowa</i> -----	1
5. <i>Chortippus curtipennis</i> -----	1		
6. Two other species-----	1		
		<u>Soybeans</u>	
		1. <i>Melanoplus mexicanus</i> -----	80
		2. <i>Melanoplus femur-rubrum</i> -----	17
		3. <i>Ageneotettix deorum</i> -----	3
<u>Roadside</u>			
1. <i>Melanoplus mexicanus</i> -----	100		

Grand total

	<u>Percent</u>
1. <i>Melanoplus femur-rubrum</i> -----	65
2. <i>Melanoplus mexicanus</i> -----	31
3. <i>Cammula pellucida</i> -----	1
4. <i>Orphulella speciosa</i> -----	1
5. <i>Mestobregma kiowa</i> -----	1
6. Nine other species-----	1

WYOMING

In this State most of the collecting was confined to the northern desert-shrub or sagebrush area and the short-grass areas of the State. From two to seven times as many specimens were taken as in some other States, viz., 21,189 specimens from 9 habitats. These specimens represented 42 species, in habitats as follows: 30 in small grain, 37 in legumes, 22 in coulees, 26 along hillsides, 31 on range land, 25 in idle and reverted land, 25 along roadsides, and 24 in meadows. The heaviest infestations were in the irrigated sections of the northern and eastern two tiers of counties. Range losses were exceptionally heavy in the six northeastern counties. Populations had increased in the irrigated sections and decreased only on the range in the primary drought areas.

Melanoplus mexicanus was the most numerous species, with *M. femur-rubrum* second and *M. bivittatus* a close third. *Aulocara ellioti* and *Ageneotettix deorum* were about equal in numbers on the range lands. *M. packardii* was numerous in many places.

According to the collections, the most marked change from 1935 to 1936, has been the reduction in abundance of *Cammula pellucida*. In 1935 this species was dominant on the range land, at 23 percent, and was among the first five most

numerous species in five out of the six recorded habitats. It was also second in numbers, at 21 percent, to M. mexicanus, which was first, at 23 percent, in the total number of specimens collected for the State. In 1936 on the range C. pellucida formed only 0.17 percent of the hoppers and was seventh in numbers, at 4 percent of the total collected for the State. On the other hand, A. ellioti rose from fourth place on the range, at 6 percent in 1935, to first place, at 19 percent in 1936, and from seventh place, at 2 percent of the total number collected, to fourth place at 9 percent. M. mexicanus had increased its lead over the nearest competitors of 1935. On C. pellucida this increase was from 2 percent in 1935 to 22 percent in 1936; on M. bivittatus from 5 to 15 percent, and M. femur-rubrum from 7 to 12 percent. All these figures were computed on the basis of the total numbers of specimens collected in these years. The distribution by species of 21,189 specimens collected in Wyoming, expressed in percentage of total number taken in each habitat, is shown in the following table.

Species	Percentage collected in--							Total specimens	% of grand total
	Small grain	Legumes	Coulee	Hillside	Range	Reversion	Roadside	Meadow	River bottom
<i>Aeoloplus turnbullii</i>	0.85	5.05	0.41	0.15	1.76	0.34	2.36	0.06	2.18
<i>Ageneotettix deorum</i>	5.22	1.76	19.51	28.26	17.84	6.61	5.44	30.54	7.73
<i>Amphitarnus coloradus</i>	.14	.21	.41	2.00	1.61	.11	.20	.41	.84
<i>Arphia pseudonietana</i>	.03	.01	--	.15	.04	.11	--	11.26	.04
<i>Aulocara elliotti</i>	4.97	3.50	9.35	7.68	19.33	30.89	4.66	--	12.56
<i>Bruneria brunnea</i>	--	--	--	--	.29	--	.33	--	--
<i>Camula pellucida</i>	9.38	2.80	1.02	--	.17	2.74	5.38	10.57	5.00
<i>Chortippus curtippennis</i>	--	.06	--	--	--	--	--	--	.08
<i>Cordillacris crenulata</i>	--	.03	2.44	.46	.58	--	.06	--	.04
<i>Cratypedes neglectus</i>	.03	--	--	--	--	--	--	--	--
<i>Derotnema haydenii</i>	.52	.17	--	--	.53	.68	.46	.21	.13
<i>Dissosteira carolina</i>	.82	.42	--	.15	--	.68	.59	.14	.17
<i>Drepanopterna femoratum</i>	.38	.22	1.42	1.54	6.65	.57	.85	2.21	6.26
<i>Encyrtolophus costalis</i>	--	.05	--	--	--	--	--	.21	.38
<i>Gomphocerus clavatus</i>	--	.04	--	--	--	--	--	--	--
<i>Hadrotettix trifasciatus</i>	.20	.13	--	1.23	--	.57	.52	.06	.17
<i>Hesperotettix viridis</i>	.42	.19	--	7.68	1.53	2.39	--	.76	.08
<i>Hypochlora alba</i>	--	--	--	.31	--	--	.06	--	.04
<i>Melanoplus angustipennis</i>	5.52	1.59	.41	3.07	5.41	.80	10.76	.41	4.07
<i>Melanoplus bivittatus</i>	12.27	18.46	--	3.99	.45	.46	15.09	.48	7.90
<i>Melanoplus bowditchi</i>	.75	.01	1.02	7.53	1.61	--	.26	.14	.38
<i>Melanoplus confusus</i>	--	.09	--	--	--	--	--	--	--
<i>Melanoplus dawsoni</i>	--	.01	--	.31	.25	--	--	--	--
<i>Melanoplus differentialis</i>	.20	1.89	--	--	.08	.23	.66	--	.34
<i>Melanoplus femur-rubrum</i>	5.01	27.51	3.25	--	3.01	1.03	9.18	2.49	12.01
<i>Melanoplus flavidus</i>	.78	.40	--	--	1.32	.34	2.49	--	.21
<i>Melanoplus gladstoni</i>	.52	.21	--	.15	.62	.16	.59	.55	.29
<i>Melanoplus infantilis</i>	2.42	1.14	5.08	5.68	3.63	1.37	2.36	6.08	1.01
<i>Melanoplus keeleri luridus</i> Dodge	.07	--	--	--	--	--	.33	--	--
<i>Melanoplus mexicanus</i>	40.58	22.99	13.21	23.96	13.59	39.44	22.70	30.68	32.05
<i>Melanoplus occidentalis</i>	.75	.39	1.83	--	5.03	2.28	1.25	.21	.13
<i>Melanoplus packardii</i>	6.78	9.93	1.22	2.46	6.65	6.38	11.15	1.66	1.22
<i>Mermiria maculipennis</i>	--	.01	--	--	--	--	.13	--	--
<i>Mestobregma kiowa</i>	.10	.04	6.50	.80	1.03	.34	.20	.10	.59
<i>Metator pardalinus</i>	.15	.13	1.63	.77	.67	.80	.07	.35	.55

Species	Percentage collected in--									Total speci- mens	% of grand total
	Small grain	Leg- umes	Cou- lee	Hill- side	Range	Rever- sion	Road- side	Meadow	River bottom		
<i>Opeia obscura</i> - - - - -	--	0.02	28.85	0.61	.82	--	0.13	--	1.43	204	0.96
<i>Phlibostroma quadrimaculatum</i> -	.15	.08	1.42	.61	4.09	--	.49	.07	.50	140	.66
<i>Phoetaliotes nebrascensis</i> - - -	.03	.05	.42	.15	.21	--	--	--	.34	21	.10
<i>Spharagemon collare</i> - - - - -	.72	.16	--	--	.87	.34	.92	.35	.10	80	.38
<i>Spharagemon eguale</i> - - - - -	.24	.22	.20	.15	.21	.34	.20	--	1.18	67	.31
<i>Trimerotropis pistrinaria</i> Sauss.	--	--	.20	.15	.12	--	.06	--	--	6	.03
<i>Trimerotropis pallidipennis</i> - -	--	.03	.20	--	--	--	.07	--	--	5	.02
Numbers collected - -	2,928	8,467	492	651	2,422	877	1,524	1,448	2,380	21,189	--

The percentages of individuals of the various species present in Wyoming, arranged according to habitat, were as follows:

Small grain

Percent

1. <i>Melanoplus mexicanus</i> -----	41
2. <i>Melanoplus bivittatus</i> -----	12
3. <i>Camnula pellucida</i> -----	9
4. <i>Melanoplus packardii</i> -----	7
5. <i>Melanoplus angustipennis</i> -----	5
6. Twenty-five other species-----	26

Coulee

1. <i>Opeia obscura</i> -----	29
2. <i>Ageneotettix deorum</i> -----	20
3. <i>Melanoplus mexicanus</i> -----	13
4. <i>Aulocara ellioti</i> -----	9
5. <i>Melanoplus infantilis</i> -----	5
6. Seventeen other species-----	24

Range

1. <i>Aulocara ellioti</i> -----	19
2. <i>Ageneotettix deorum</i> -----	18
3. <i>Melanoplus mexicanus</i> -----	14
4. <i>Drepanopterna femoratum</i> -----	7
5. <i>Melanoplus packardii</i> -----	7
6. Twenty-six other species-----	35

Roadside

1. <i>Melanoplus mexicanus</i> -----	23
2. <i>Melanoplus bivittatus</i> -----	15
3. <i>Melanoplus packardii</i> -----	11
4. <i>Melanoplus angustipennis</i> -----	10
5. <i>Melanoplus femur-rubrum</i> -----	9
6. Twenty-eight other species---	32

River bottom

1. <i>Melanoplus mexicanus</i> -----	32
2. <i>Aulocara ellioti</i> -----	13
3. <i>Melanoplus femur-rubrum</i> -----	12
4. <i>Melanoplus bivittatus</i> -----	8
5. <i>Ageneotettix deorum</i> -----	7
6. Twenty-eight other species---	28

Legumes

Percent

1. <i>Melanoplus femur-rubrum</i> -----	27
2. <i>Melanoplus mexicanus</i> -----	23
3. <i>Melanoplus bivittatus</i> -----	18
4. <i>Melanoplus packardii</i> -----	10
5. <i>Aeoloplus turnbullii</i> -----	5
6. Thirty-two other species-----	17

Hillside

1. <i>Ageneotettix deorum</i> -----	28
2. <i>Melanoplus mexicanus</i> -----	24
3. <i>Aulocara ellioti</i> -----	8
4. <i>Hesperotettix viridis</i> -----	8
5. <i>Melanoplus bowditchi</i> -----	7
6. Twenty-one other species-----	25

Reversion

1. <i>Melanoplus mexicanus</i> -----	39
2. <i>Aulocara ellioti</i> -----	31
3. <i>Ageneotettix deorum</i> -----	7
4. <i>Melanoplus packardii</i> -----	6
5. <i>Camnula pellucida</i> -----	3
6. Twenty other species-----	14

Meadow

1. <i>Melanoplus mexicanus</i> -----	31
2. <i>Ageneotettix deorum</i> -----	30
3. <i>Arphia pseudonietana</i> -----	11
4. <i>Camnula pellucida</i> -----	10
5. <i>Melanoplus infantilis</i> -----	6
6. Nineteen other species-----	12

Grand total

1. <i>Melanoplus mexicanus</i> -----	26
2. <i>Melanoplus femur-rubrum</i> -----	14
3. <i>Melanoplus bivittatus</i> -----	11
4. <i>Aulocara ellioti</i> -----	9
5. <i>Ageneotettix deorum</i> -----	8
6. Thirty-seven other species---	32

ARIZONA

In general, the grasshopper populations were shown by the survey to be very low; however, in limited areas they were present in sufficient numbers for potential increase and spread to outbreak proportions. The most severe infestations were in Apache, Navajo, Coconino, Yavapai, and Gila Counties. The most important economic species were Melanoplus bivittatus, Camnula pellucida, and M. femur-rubrum.

ARKANSAS

The worst infestations were mostly in the northern two tiers of counties, which averaged from 5 to 10 percent infestation, 23 counties being involved in the State. The most important species in relation to crop damage was Melanoplus differentialis. Other prominent species were M. mexicanus, M. femur-rubrum, and M. impiger Scudd.

CALIFORNIA

The most severe infestations were in the north-central counties, as far north as Yuba County and south to Madera County. There were heavy infestations of Melanoplus mexicanus in the Imperial Valley, where two generations of this species occur annually. There were other spots of heavy infestation.

Based on damage to grazing land and cultivated crops, Camnula pellucida, M. mexicanus, and M. devastator Scudd. were about equally important, with M. marginatus Scudd. and M. femur-rubrum second in importance, and M. differentialis, Oedaleonotus enigma Scudd., O. borckii pacificus Scudd., and Hippiscus californicus Scudd. of somewhat less importance. M. devastator inhabits the foothills of the coast and the inland ranges of the Sierra Nevadas.

IDAHO

There were numerous small areas in which populations were slightly above normal in practically all of the counties of the State, with a definite increase in the grasshopper populations.

The most important species was Melanoplus femur-rubrum, with M. mexicanus second and M. bivittatus third.

ILLINOIS

The records were not complete for the individual survey stops. Most of the infestations were in a large area throughout the central part of the State, including most of the western boundary counties.

M. femur-rubrum, M. mexicanus, and M. differentialis were most numerous. M. differentialis probably did the most damage because it was concentrated on the corn, which is the most valuable crop attacked in this region.

IOWA

The most severe infestations occurred in the western and southern parts of the State, although the entire State was more or less involved.

In various districts of the State different species were of greatest importance. In the northwestern counties Melanoplus mexicanus was first and M. bivittatus second. In the west-central part there was more of a mixture of M. mexicanus, M. bivittatus, M. differentialis, and M. femur-rubrum. M. differentialis was more important in the southwestern district. In the south-central, central, and eastern sections M. femur-rubrum was dominant, with M. differentialis second in numbers. M. mexicanus had a partial second generation in 1936, which hatched out the last week of August.

The following is a list submitted by C. J. Drake. The grasshoppers were collected in Iowa in 1936 and determined by M. Hebard.

- Pseudopomala brachytera Scudd., Woodbury County.
Mermiria maculipennis macclungi Rehn, Plymouth and Sioux Counties.
Syrbula admirabilis Uhl., Warren and Clark Counties.
Opeia obscura Thos., Sioux County.
Phlibostroma quadrimaculatum Thos., Sioux and Harrison Counties.
Orphulella speciosa Scudd., common to abundant in Clark, Union, Davis, Lyon, Plymouth, Adams, and Sioux Counties.
Orphulella pelidna Burm., Woodbury County.
Dichromorpha viridis Scudd., Davis, Story, Webster, and Woodbury Counties.
Chortippus longicornis Latr., Clay, Palo Alto, and Davis Counties (in swale).
Ageneotettix deorum deorum Scudd., abundant in pastures in Sioux, Adams, Lyon, Warren, Harrison, Woodbury, Clark, Crawford, Webster, and Plymouth Counties.
Arphia xanthoptera Germ., Warren, Clark, and Decatur Counties.
Arphia simplex Scudd., Sioux County.
Arphia pseudonietana Thos., Plymouth and Woodbury Counties.
Chortophaga viridifasciata Deg., Decatur, Clark, and Lee Counties.
Encoptolophus sordidus sordidus Burm., Clark, Warren, Decatur, Adams, and Lyon Counties.
Hippiscus rugosus Scudd., Van Buren, Clark, Sioux, Warren, Harrison, Lyon, and Plymouth Counties.
Hippiscus haldemanii Scudd., Harrison, Sioux, Plymouth, Union, and Audubon Counties.
Dissosteira carolina L., common in Pottawattamie, Warren, Davis, Webster, Monona, Audubon, Clark, Clay, Sioux, Woodbury, Plymouth, and Harrison Counties.

Spharagemon bolli Scudd., Lee County.

Spharagemon equale Say, Lyon County.

Spharagemon collare Scudd., Muscatine, Sioux, Clark, Clay, and Harrison Counties.

Mestobregma kiowa kiowa Thos., common on prairies in Plymouth, Sioux, Lyon, Harrison, Monona, and Woodbury Counties.

Mestobregma kiowa fuscifrons Stal, Warren and Clark Counties.

Psinidia fenestralis fenestralis Serv., Muscatine County on sand hills.

Trimerotropis citrina (atypic) Scudd., Muscatine County on sand hills.

Trimerotropis laticincta Sauss., Story County, new State record, Hebard.

Hadrotettix trifasciatus Say, Lyon, Sioux, and Plymouth Counties.

Schistocerca americana americana Drury, Clark County.

Schistocerca alutacea lineata Scudd., more abundant than usual in Clark, Woodbury, Plymouth, Union, and Warren Counties.

Schistocerca alutacea alutacea ? Harr., Warren County.

Campylacantha olivacea olivacea Scudd., Clark County.

Melanoplus bivittatus Say, abundant, general in northwestern Iowa, Sioux and Crawford Counties.

Melanoplus differentialis Thos., generally abundant.

Melanoplus confusus Scudd., Plymouth and Sioux Counties.

Melanoplus femur-rubrum femur-rubrum Deg., generally abundant.

Melanoplus mexicanus mexicanus Sauss., generally abundant.

Melanoplus keeleri luridus Dodge, Warren, Plymouth, and Lyon Counties.

Melanoplus foedus fluviatilis Brun., Harrison, Lyon, Woodbury, and Sioux Counties.

Melanoplus angustipennis Dodge, Muscatine County.

Melanoplus gracilis Brun., Warren and Clark Counties.

Melanoplus scudderii scudderii Uhl., Union County.

Melanoplus walshii Scudd., Warren County.

Melanoplus borealis junius Dodge, Clay County.

Melanoplus packardii Scudd., Warren, Sioux, Clark, and Plymouth Counties.

Phoetaliotes nebrascensis Thos., Sioux and Lyon Counties.

MISSOURI

The most severe infestations were in the northwestern portion of the State. *Melanoplus mexicanus* was first in numbers with *M. differentialis* second, *M. femur-rubrum* third, and *M. bivittatus* fourth.

NEBRASKA

Except for the large sand hill area in the middle of the State, there were severe infestations all through the eastern, southern, and western parts. The important species were *Melanoplus mexicanus*, which was first in numbers, *M. differentialis* second, *M. bivittatus* third, *M. femur-rubrum* fourth, and *M. packardii* fifth.

NEVADA

The most severe infestations were in Lyon County and in the northern and northwestern parts of the State. Camnula pellucida was the only species recorded as important.

NEW MEXICO

The area where the most trouble is expected is in northern Santa Fe County and in Rio Arriba County. Over the entire State populations were down. Melanoplus bivittatus and M. femur-rubrum were the most important species.

OKLAHOMA

The worst infestations were in the northeastern and southwestern quarters of the State and over all but the southeastern quarter conditions were from light to threatening. Severe drought and heat delayed egg laying until the middle of September and also destroyed large numbers of adults.

The dominant species was Melanoplus differentialis, with both M. mexicanus and M. bivittatus second in importance.

OREGON

Grasshopper populations were lower than normal in most areas surveyed. All threatening infestations were found on range lands. The south-central and extreme northeastern parts of the State had the worst infestations.

Camnula pellucida was by far the most important species, but there were extremely localized infestations of Melanoplus mexicanus and M. femur-rubrum.

KANSAS

Infestations were general over the entire State. The most important species were Melanoplus mexicanus, M. differentialis, and M. bivittatus, in the order of their importance.

SUMMARY

The most important change that took place in the relative abundance of the species was the increase of Melanoplus femur-rubrum in several of the States where collections were made, viz., Wisconsin, Minnesota, and Utah. In eastern Iowa it was the most numerous species and in southern Minnesota it was the most destructive of the grasshoppers. Another change was the increase of Aulocara ellioti in the Mountain States, both on the range and in small grain. In Montana Cordillacris crenulata dropped from first to eighth place in abundance

in the grazing areas. M. mexicanus increased its lead over its closest competitors as much as 36 percent in small grain in western North Dakota, where it reached its greatest importance in relation to the other species. In both North Dakota and Montana it constituted 60 percent of the grasshopper population in idle or reverted lands. This bears out the fact that such places are good habitats for this particular species. Amphitornus coloratus, Philibostroma quadrimaculatum, and a few others had fallen off in numbers.

In areas where drought was severe in 1936, drastic reductions in adult populations occurred last summer. Melanoplus bivittatus and M. differentialis, especially, suffered great mortality from the extreme heat and drought. These species were prominent only in the irrigated sections of some of the Mountain States and along the water courses in some other States.

Man has disturbed the balance of nature in the original flora of all these areas by farming and grazing practices and by introducing new plants. These new food plants, largely crops, are in turn more susceptible to weather changes than are the fully adapted native plants. This change in flora has had its effect on the original grasshopper fauna by causing rapid fluctuations in the relative numbers of any species. This, in part, accounts for recent outbreaks. Of all the species involved therein, M. mexicanus seems to have been able to retain its supremacy under the last 4 years of severe drought conditions, which indicates that this species was best adapted to such conditions.

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THE MORE IMPORTANT RECORDS FOR MAY

During the last week in the month grasshopper hatching was generally under way on the Great Plains and in the upper Mississippi Valley. In the East Central States hatching had begun but was decidedly retarded by cool wet weather. In general, these insects are numerous enough to cause considerable trouble this year.

Mormon crickets in many places are migrating from the egg beds and are reported as decidedly more abundant than last year over the greater part of the infested territory from South Dakota, to Idaho and Utah.

Damage by wireworms is recorded over a wide territory from Connecticut to the Carolinas and westward to California. The outbreaks, however, are scattered.

The curculio Maenactus leucoloma Boh., which was discovered for the first time in the United States in Okaloosa County, Fla., last year, is again active. The insect is attacking a wide variety of crops, including velvetbeans, peanuts, corn, and cotton. In some fields three-fourths of the corn plants have been destroyed.

May beetles began to emerge during the latter half of the month. Heavy flights were recorded in the South Atlantic States and in Kentucky, with instances of complete defoliation. The white grubs were reported as doing considerable damage to pastures in parts of Minnesota.

Cutworms are generally abundant and destructive. Considerable damage in the East Central States was caused by climbing cutworms.

A heavy armyworm outbreak is under way in the Mississippi Valley. The earliest reports were received from Mississippi and Arkansas, and later in the month reports of damage were received from as far north as Illinois,

and westward through Oklahoma to Texas. Over 20,000 acres of oats were lost in one county in southeastern Arkansas. Reports of damage by this insect have also been received from eastern Virginia and the Eastern Shore of Maryland.

General and heavy infestations of the corn ear worm are reported from Florida and Georgia, and around the Gulf to Louisiana. In Los Angeles County Calif., rather heavy infestations have been reported on sweet corn.

The chinch bug has been slow in leaving winter quarters in the East Central States. About the middle of the month localized but somewhat severe infestations were reported from South Carolina and Mississippi.

The pea aphid is decidedly abundant and destructive over a wide area attacking both alfalfa and peas. Reports of heavy infestation of alfalfa have been received from Virginia, Kansas, Utah, and the Pacific Northwest, while damaging populations on peas were recorded from southeastern Virginia, Delaware, and Maryland and parts of Ohio and Utah. The insect is thus far comparatively scarce in Wisconsin.

The clover leaf weevil has been unusually abundant in the East Central States and westward to eastern Kansas and Iowa.

During the month the vetch bruchid was reported from four additional counties in North Carolina.

Spring-brood emergence of the codling moth was about complete the third week in May in Georgia. In west-central Virginia the first moths were taken by the middle of the month, first moths appeared in Delaware on May 6, in Pennsylvania on May 19, and up to May 24 no moths had yet appeared in the upper part of New York State. In the Mississippi Valley the peak of emergence was reached during the last week in the month in Missouri and southern Illinois. The first adults were observed in southern Ohio on May 17. Over a large part of the area the infestations are from moderate to high.

Although in general the eastern tent caterpillar appears to be less abundant than it was last year, populations are heavy throughout New England and the Middle Atlantic States, in some places being even greater than last year.

Fruit aphids, in general, are decidedly less troublesome than usual.

The plum curculio infestation in the Georgia fruit belt is said to be the lightest in 18 years. No heavy infestations by this insect have yet been reported from any of the States.

The seed corn maggot was very abundant in the lower Mississippi Valley, from Kentucky and Missouri westward to Nebraska and Oklahoma. Reports have been received of severe damage to peas in Washington State and to beans in the vicinity of Washington, D. C.

Survival of the Mexican bean beetle in hibernation cages in Columbus, Ohio, was the heaviest for several years. The insect started appearing early in the month in Virginia, Georgia, and Alabama, and late in the month was quite prevalent at least as far north as Maryland.

The beet leafhopper populations are rather large both in southern Idaho and in Utah.

The boll weevil is appearing in larger numbers than at any time during the last 3 years in parts of South Carolina, whereas in Georgia the brood seems to be the smallest in many years, as is also the case in the Delta section of Mississippi and in Louisiana. Emergence in Texas was very high, having been exceeded only three times in the past 12 years.

There was a heavy emergence of the pink bollworm in the Big Bend of Texas during the last week in April, indicating higher survival than last year.

Periodical cicada appeared during the last 2 weeks of the month throughout its known habitat.

A heavy outbreak of cankerworms appeared in northeastern Missouri. By the end of May they were stripping elms and other trees. Reports of similar, though less severe, damage were received from New England, New York, Ohio, Indiana, and Oklahoma.

Dog ticks are apparently more abundant than usual throughout the Middle Atlantic and East Central States.

GENERAL FEEDERS

GRASSHOPPERS (Acrididae)

- Illinois. W. P. Flint (May 24): Grasshopper eggs have been hatching in central Illinois for the past 2 weeks. The hatch has been slow, except on the sand areas. Probably not more than 2 percent of the eggs have hatched.
- Wisconsin. E. L. Chambers (May): A few were just beginning to hatch on the lighter soils in Green County. Cold, cloudy weather is holding them back.
- Iowa. C. J. Drake (May 19): Grasshoppers are hatching throughout most of the infested areas in the State. County agents in the western part of the State and in sandy areas along the Mississippi River are reporting very heavy hatching. Baiting has started on Muscatine Island, but not much bait will be broadcast before the first week of June.
- Missouri. L. Haseman (May 26): Moderate-to-heavy hatching of grasshoppers has been reported the last 10 days, particularly on sunny slopes, all the way from Arkansas to the Iowa line. Some counties are reporting the hatch as the most threatening they have ever known.
- Arkansas. Little Rock Democrat (May 21): The first report of grasshopper damage was received today from Poinsett County, where 50 acres of cotton and soybeans have been destroyed.
- North Dakota. F. G. Butcher (May 24): Grasshopper hatching just getting under way in the western and central counties. The predominant species is Melanoplus mexicanus Sauss., hence early injury is apparent in wheat fields.
- South Dakota. H. C. Severin (May 21): Reports of large hatches of grasshoppers have been sent from a few counties. We do not expect as serious an outbreak as that of last year.
- Nebraska. M. H. Swenk (May 20): Grasshoppers, M. differentialis Thos., M. bivittatus Say, and other species, began hatching in south-central and northeastern Nebraska during the last week in April, but it was well toward the middle of May before the hatching became general and heavy. An exceptionally heavy hatch is now under way in at least one-third of the counties and damage is being done in fields of alfalfa, clover, and other crops.
- Kansas. H. R. Bryson (May 15): Reports of the occurrence of young hoppers have been received from Chanute and Augusta, in southeastern Kansas.
- J. R. Horton (May 21): A survey of 40 separate square-foot samples of wheat and alfalfa land on April 14 disclosed 11 grasshopper egg pods. Eggs viable. Hatching began about May 15. Young hoppers conspicuous today.

- Oklahoma. C. F. Stiles (May 20): Grasshoppers are being reported in large numbers throughout the northern and western sections of the State. Osage and Comanche Counties report that they are three times as numerous as they were in 1936. At present they are quite small and a number of species are involved.
- Texas. R. R. Reppert (May 26): Cottle, Dallam, Gray, Hamilton, Hardeman, Lipscomb, Throckmorton, and Wheeler Counties are reporting heavy infestations of grasshoppers.
- Montana. H. B. Mills (May 20): Hoppers are now hatching throughout the State. They are extremely abundant but infestations are spotted. Some are in the third instar.
- Idaho. J. R. Douglass (May 8): Young grasshoppers were observed in the foothills of the Snake River plains of south-central Idaho.
- Utah. G. F. Knowlton (May 8): Nymphs are becoming moderately abundant in some fields in northern Utah. (May 17): They are damaging young beets at Provo, Utah County, and are especially abundant in alfalfa west of Kaysville, Davis County. One winged adult, Trimerotropus vinculata Scudd., was observed at Farmington, Davis County.
- Nevada. G. G. Schweis (May 25): Grasshoppers have been reported from Lyon and Washoe Counties in destructive numbers and control campaigns are being inaugurated.
- California. S. Lockwood (May 10): Grasshoppers in San Luis Obispo County range from the first nymphal instar to adults. The outbreak is not as serious as that of 2 years ago. Grasshoppers are appearing in great numbers in Imperial County. (May 25): M. mexicanus is more than ordinarily abundant in the Imperial Valley. Most of them are adults or are in the fifth instar. Mating has not been observed. Alfalfa, melons, and other vegetable crops are being considerably damaged.
- MORMON CRICKET (Anabrus simplex Hald.)
- South Dakota. H. C. Severin (May 21): Mormon crickets have been reported as very abundant in Mellette and Lyman Counties. If these crickets become seriously harmful in South Dakota this year, it will be for the first time. Heretofore, the crickets were regarded chiefly as a curiosity.
- Montana. H. B. Mills (May 20): Mormon crickets are worse this year than ever before. They cover considerable territory in a triangular area extending from Madison and Powder River Counties on the south to Hill and Glacier Counties on the north.
- Wyoming. C. L. Corkins (April 28): Hatching was reported in the Crooked Creek area in northern Big Horn County on April 5. Dusting operations were started in this district April 19. On April 27 the crickets were in the second instar and were severely damaging alfalfa fields. April 27 the hatch was out over all the lowlands in Sheridan County and covers all of

the area shown in the fall egg survey. The hatch was also out in Crook County and covers twice as much territory as shown in the fall survey. Eggs have started to hatch in the lowlands of Converse County, but have not yet hatched in Washakie, Teton, and Lincoln Counties, as the beds have been covered with snow. Dusting operations were started in Sheridan and Crook Counties April 26.

Idaho. C. Wakeland (May 25): In the earliest counties Mormon crickets are reaching the sixth instar in development, while in the later areas they are in the first and second instars. The crickets farthest advanced in development are migrating freely and invading adjacent cultivated areas. The population is much heavier and more widely distributed in western Idaho than in 1936.

Utah. C. J. Sorenson (May 20): Infestations in Juab, Millard, and Tooele Counties are heavier and more widespread than in 1936. Hatching began late in February in parts of Tooele County and on March 5 in Millard County.

Nevada. G. G. Schweis (May 25): The control campaign against the Mormon cricket is underway in Elko, Humboldt, Eureka, and Lander Counties.

WIREWORMS (Elateridae)

Connecticut. N. Turner (May 4): About one-half acre of transplanted lettuce in Bridgeport badly damaged by Melanotus sp. Fifty percent of the plants killed, 3 to 4 wireworms per plant.

Maryland. E. N. Cory (May 19): Larvae are injuring young tomato plants at Hagerstown.

South Carolina. F. Sherman (May 24): Wireworms are injuring tobacco in eastern South Carolina, reported by J. G. Watts.

W. M. Lunn and N. Allen (May 22): Slightly more than 16 acres of tobacco is being grown on the Pee Dee Experiment Station farm, in Florence County. The plants were transplanted during April and the first part of May, and it has since been necessary to replace approximately 60 percent of them. Examination of plants in the field shows that from 70 to 80 percent of all plants have been injured by wireworms, approximately 20 percent of the plants having been destroyed.

Indiana. J. J. Davis (May 27): Wireworms have been reported as destroying corn at Greensburg and Paoli.

Missouri. L. Haseman (May 26): Scattered reports of wireworm injury have been received from points throughout the State, the last ones referring to damage to winter barley.

North Dakota. J. A. Munro (May): Farmers in eastern counties are expressing concern about the possibility of serious injury to corn, barley, and other crops from wireworms. Reports indicate that the wireworm population is especially high in fields which were summer-fallowed last year.

Nebraska. M. H. Swenk (May): On May 1 a Custer County correspondent reported that his field, just recently plowed, was badly infested with corn-wireworms (Melanotus sp.). A complaint of wireworms damaging planted potatoes in Antelope County was sent in on May 19.

Oregon. H. P. Lancaster (May 24): Larvae of Limonius canus Lec. and L. californicus Mann. were found feeding on nearly every pea plant examined in lowland on both sides of a small stream near Athena, Umatilla County, in northeastern Oregon. About 50 percent of the plants have been killed.

California. M. W. Stone (April 30): Specimens of Acolus livens Lec. submitted by C. S. Morley of Kern County, who reported they were damaging melons near Bakersfield.

A CURCULIONID (Amalus haemorrhous Hbst.)

Washington. W. W. Baker (May 12): Five specimens have been swept from clover, grass, mustard, Rumex acetosella, and equisetum growing near the laboratory at Puyallup. Attempts to find it on heather have so far been unsuccessful.

A CURCULIONID (Naupactus leucoloma Boh.)

Florida. J. R. Watson (May 22): This insect, which was discovered last year for the first time in a small section of Okaloosa County and adjacent parts of Alabama, is again active. The grubs are doing severe damage over a limited area. In some fields a third of the cotton plants were being destroyed and three-fourths of the corn. The pest was also attacking velvetbeans and peanuts. It seems to be a general feeder. No adults and no pupa were observed the middle of May. Identification by L. L. Buchanan.

JAPANESE BEETLE (Popillia japonica Newm.)

Connecticut. W. E. Britton (May 21): Lawn diggings indicate that the Japanese beetle will doubtless be more abundant this year than ever before in Branford, Bridgeport, Hartford, New London, New Haven, and Ridgefield, all in the southern part of the State.

ORIENTAL BEETLE (Anomala orientalis Wtrh.)

Connecticut. W. E. Britton (May 21): This insect is spreading slowly in the vicinity of New Haven, where many untreated lawns have been injured. We are now finding it in some other towns and cities.

New York. W. E. Blauvelt (May 24): A heavy infestation of grubs was observed in a large lawn at Wheatley Hills, Long Island, on May 12. Several square-foot diggings in the worst-infested part yielded an average of 80 grubs per square foot. Much of the turf had been killed out. (Det. by H. C. Hallock.)

ASIATIC GARDEN BEETLE (Autoserica castanea Arrow)

Connecticut. W. E. Britton (May 21): Some injury by the adults to various flowering plants in New Haven has been observed but seldom are the grubs found in lawns. Two lots of grubs received this spring indicate that the beetle may soon become troublesome also as a lawn pest.

New York. W. E. Blauvelt (May 24): Considerable injury to lawn turf was observed at Rye, Westchester County, on May 10. (Det. by H. C. Hallock.)

MAY BEETLES (Phyllophaga spp.)

Vermont. H. L. Bailey (May 25): Up to May 25 only a few scattered adults were noted at Montpelier, Washington County, central Vermont.

Georgia. T. L. Bissell (May 14): On May 5 we received a report of damage to pecan trees by May beetles, the first record of injury this year.

Virginia. G. R. French (May 22): I was struck with the large numbers of one of the May beetles in Culpeper and Rappahannock Counties this week. I saw one 20-foot oak tree that was entirely stripped and a neighboring maple was partly defoliated.

R. A. St. George (May): P. fervida F., P. inversa Horn, P. fratern Harr., and P. hirticula Knoch, were collected at Falls Church on May 4 and 5.

Kentucky. W. A. Price (May 22): Hordes of May beetles are feeding on oak and persimmon trees at Lexington. This is the first real damage they have done.

Wisconsin. C. L. Fluke (May 20): Flights of the adults have been light, as temperatures so far have been too low for extensive ones. The first appearance was noticed May 7.

Minnesota. D. J. Pletoch (May 1): White grubs have caused much damage to pasture in Goodhue County. Upon digging damaged hillside slopes, some adults were found near the surface. These were P. tristis F., most abundant, and P. fusca Froel. At depths of from 6 to 18 inches numerous larvae were found. Some were Brood A, but apparently most were Brood B. They averaged about 5 or 6 per square foot. Last fall the entire pasture sod could be peeled back easily, but self-seeding has brought back most of it.

North Dakota. J. A. Munro (May): May beetles moderately abundant at Fargo. Most of the adults are in the top layer of soil but a few have been observed in flight.

Utah. G. F. Knowlton (May 18): A few adult brown May beetles were collected at Logan during the past week.

CUTWORMS (Noctuidae)

- New York. R. W. Leiby (May 20): Reports of cutworm damage indicate that these insects are present over the State in more than average numbers. Control measures being generally applied.
- South Carolina. W. C. Nettles (May 21): Cutworms were damaging cotton and truck crops near Ridgeland the first part of May.
- Florida. F. S. Chamberlin (May 6): Cutworms are causing more damage than normal to newly set tobacco in Gadsden County. Infestations are most harmful in the later settings.
- Ohio. T. H. Parks (May 24): An outbreak of climbing cutworms on grapes developed in a large vineyard in Franklin County, central Ohio, the week of April 25. The cutworms were rapidly devouring the young grape buds. The adjoining county, Fairfield, was the only other county from which similar trouble was reported.
- Indiana. J. J. Davis (May 27): Cutworms have damaged onions and buds of apple and peach in northern Indiana.
- Kentucky. W. A. Price (May 24): Cutworms are abundant over the State.
- Michigan. R. Hutson (May 20): Climbing cutworms have been injurious in various parts of the State. We have had numerous reports of injury.
- Wisconsin. E. L. Chambers (May 25): Losses from cutworms are being reported from the light, sandy areas of Waushara, Waupaca, and Shawano Counties, in southeastern Wisconsin.
- C. L. Fluke (May 20): Cutworms are showing up in large numbers in central Wisconsin.
- Tennessee. L. B. Scott (May 8): Cutworms are extremely abundant and seriously damaging tobacco, corn, tomatoes, and peppers in Montgomery County. (May 25): As many as 10 dead cutworms found near one tobacco plant in a field near Clarksville which has been treated with poison bait. This field averaged $3\frac{1}{2}$ dead worms per plant. Many growers who failed to use bait have been forced to reset more than 50 percent of their plants. A man from the laboratory collected 700 cutworms in a neglected pasture in 90 minutes.
- Mississippi. C. Lyle (May 24): Specimens of Lycophotia margaritosa saucia Hbn. on cotton were received from Yazoo City on May 5 and from Criger on May 9. Cutworm damage in the Delta is small, as compared to last year, according to N. L. Douglass of Grenada. Specimens of Agrotis ypsilon Rott. were collected by D. W. Grimes on cotton on three plantations at Cary and Blanton, in Sharkey County.
- Louisiana. C. O. Eddy (May): Cutworms were reported to be very abundant in all parts of Louisiana.

Missouri. L. Haseman (May 13): A few moths of the greasy cutworm (A. ypsilon) were noticed about May 3 to 7 in central Missouri. (May 26): Serious complaints of cutworms are coming from the southern third of the State. In the central part half-grown cutworms are abundant and are damaging young plants.

Arkansas. D. Isely (May 20): Injury by L. margaritosa saucia in Washington, Independence, Pulaski, Lonoke, Prairie, Monroe, and Arkansas Counties. Injury to alfalfa reported most frequently.

North Dakota. F. G. Butcher (May 24): Reports of serious injury to cereals by Porosagrotis orthogonia Morr. in several counties in the western half of the State.

South Dakota. H. C. Severin (May 21): Cutworm damage is about normal over most of the State, but in certain areas the damage is more serious than usual.

Kansas. H. R. Bryson (May): Cutworms were seriously injuring ripe strawberries at Manhattan the last of May. The pale western cutworm was reported as causing considerable damage to wheat in west-central and northwestern Kansas from April 24 to May 1. Moths of the army cutworm (Chorizagrotis auxiliaris Grote) were reported as appearing in large numbers in one locality in west-central Kansas on May 20. On May 27 the variegated cutworm was attaining a considerable population in the eastern half of Kansas and some reports of injury have been received. Larvae are from one-half to two-thirds grown.

J. R. Horton (May 26): At Wichita damage by the variegated cutworm is becoming severe to wheat and young corn. Larvae are migrating from cut alfalfa to garden crops and onions are being destroyed. Some larvae are two-thirds grown.

H. H. Walkden (May 19): Approximately 5,000 fields of wheat were destroyed in Rawlins, Rush, Decatur, and Meade Counties in western Kansas during the latter part of April and early in May by the pale western cutworm. (May 20): The army cutworm was found in large numbers under cowslips in several counties in northwestern Kansas during the early part of May.

Oklahoma. C. F. Stiles (May 20): Cutworms are severely damaging gardens and all truck crops throughout the eastern half of the State. The variegated cutworm (L. margaritosa saucia) is numerous throughout the State. More than a dozen telephone calls have been received in regard to control measures.

Montana. H. B. Mills (May 20): An army cutworm, C. agrestis Grote, was abundant in spots, especially in Rosebud, Stillwater, and Gallatin Counties about May 1, although little damage is reported.

Idaho. C. Wakeland (May 25): Cutworms are destroying stands of sugar beets in southwestern Idaho and a few fields are being replanted to other crops. The long, cool spring has delayed development of the larvae and they have done an unusual amount of damage. Cutworms are also very abundant in range areas but injury is not easily apparent.

Utah. C. J. Sorenson (May 20): Cutworms are appearing in Utah County, at Cedar Valley and Lehi West Hills. A few localities on Levan Ridge, Juab County, also showing damage.

California. J. Wilcox (May 12): L. margaritosa saucia completely defoliated 4 acres of tomatoes in a strip about 1 foot wide at San Juan Capistrano, Orange County.

BEET WEBWORM (Loxostege sticticalis L.)

Montana. H. B. Mills (May 20): First appearance of adults this spring about May 16 at Bozeman, Gallatin County.

Idaho. J. R. Douglass (May 22): The adults were observed in very large numbers over an area of several square miles in the Raft River district on May 21. Upon examining the soil, numerous old cocoons were observed.

C. Wakeland (May 25): An extensive outbreak is imminent in southern and southeastern Idaho. Moths were very abundant in Russian-thistle areas last autumn and in the same areas countless numbers are now in flight at dusk.

Utah. G. F. Knowlton (May 28): Sugar beet webworm moths are becoming alarmingly abundant in Cache and Davis Counties.

H. E. Dorst (May 25): Enormous numbers of beet webworm moths have been taken in light traps in northern Utah. Many moths have been observed in sugar beet fields in Sevier Valley.

SALT-MARSH CATERPILLAR (Estigmene acraea Drury)

Georgia. T. L. Bissell (May 7): Moths are unusually numerous in central Georgia at Experiment and Milner.

Florida. H. T. Fernald (April): Caterpillars are feeding in enormous numbers on fields yellow with blossoms of Senecio lobatus along the St. Johns River west of Mims and probably all along the river.

A CABBAGE BUTTERFLY (Pieris monuste L.)

Florida. H. T. Fernald (May): A flight, under way February 6, seemed to have been checked by colder weather. It was under way again at Daytona Beach (going north) on April 10; still going north on April 24 at Daytona Beach; and I saw a car in Orlando on May 1 with many butterflies on the radiator. It had evidently come in from the East Coast. On May 10 I drove to Indian River City, then north to Daytona. The migratory flight was over, although a little north of New Smyrna they were quite abundant, feeding freely on Bidens sp., and what little movement there was was northward. Practically none at Daytona.

CRANE FLIES (Tipulidae)

Kentucky. W. A. Price (May 24): Crane flies are very abundant at Lexington.

Missouri. L. Haseman (May 26): During the last 10 days of May one of the heaviest flights of a large species of crane fly that I have ever seen in the State has appeared throughout central Missouri. In places the shrubbery, tree foliage, and grasses are literally swarming with these crane flies.

CEREAL AND FORAGE - CROP INSECTS

WHEAT AND OTHER SMALL GRAINS

CHINCH BUG (Blissus leucopterus Say)

Indiana. J. J. Davis (May 27): Chinch bugs are not yet abundant in small grain, as indicated by a few observations, but the bugs are being collected in noticeable numbers in sweepings in wild grasses.

Illinois. W. P. Flint (May 24): Chinch bugs have been very slow in leaving winter quarters because of the abnormally cool weather. Flights from winter quarters are still going on. Bugs are not all concentrated in small grains, even at this late time.

South Carolina. W. C. Nettles (May 21): On May 15 serious chinch bug outbreak was reported in York and Chester Counties.

Mississippi. C. Lyle (May 24): On April 26 a field of young corn was being destroyed at Magnolia in the southwestern part of Mississippi. Complaint of chinch bugs are rarely received from that section. A complaint was received from Meridian on May 15 and reports of serious local damage to corn on two plantations near Durant have been received.

Kansas. H. R. Bryson (May 22): Chinch bugs are present but not numerous at Manhattan.

Oklahoma. F. A. Fenton (May 24): One report on chinch bug damage was received from Claremore.

HAIRY CHINCH BUG (Blissus hirtus Montd.)

New York. W. E. Blauvelt (May 24): Adults were observed laying eggs at Locust Valley on May 1. Infestations in lawns were observed at Port Chester and Mamaroneck on May 10, at Locust Valley and Wheatley Hills on May 12, and at St. James on May 14, all in the vicinity of New York City.

APHIDS (Aphidae)

Virginia. W. J. Schoene (May 24): Alfalfa fields and oat fields at Blacksburg are being seriously injured by aphids of an undetermined species.

A. M. Woodside (May 22): Aphids are general on grain crops, but no heavy infestations have been observed, except on barley near Timberville, in Rockingham County.

ARMYWORM (Cirphis unipuncta Haw.)

Maryland. C. G. Woodbury (May 31): The country between Cape Charles and Cheriton is alive with armyworms, attacking wheat and vetch.

Virginia. H. G. Walker and L. D. Anderson (May 25): Outbreaks of armyworms have occurred in a few fields of oats, barley, and corn near Norfolk, but in general the infestation has not been as general or as severe as last year.

Indiana. J. J. Davis (May 27): Moths of the armyworm have been abundant at lights during the last week.

Illinois. W. P. Flint (May 24): There has been a moderately heavy flight of adults. Young worms are now common in heavy grass growth in the southern third of the State.

Kentucky. W. A. Price (May 26): Specimens of the armyworm were received in the mail today from Morganfield in Union County, western Kentucky, with the statement from the county agent that the outbreak was rather widespread.

Assoc. Press, Washington, D. C., Evening Star (May 31): Thousands of armyworms infested rye fields near Oakland, Warren County, in the western part of the State.

Florida. J. R. Watson (May 22): A single specimen of the true armyworm was sent in from Monticello. This is the first report of this insect in Florida for many years.

Mississippi. C. Lyle (May 24): An unusual outbreak of the true armyworm occurred in the Mississippi Delta the last of April and the first half of May. The first specimens were received from Vicksburg on April 26. Complaints were then received from Sharkey, Tallahatchie, Leflore, Sunflower, Washington, and Polivar Counties. The chief damage occurred on oats and some fields were practically destroyed before control measures were employed. Alfalfa was attacked in some fields.

Missouri. L. Haseman (May 13): Armyworm moths were present from about May 3 to 7 in central Missouri, sucking nectar from apple blossoms in such numbers as I have never seen them before at this time of the year. With a flashlight I was able to detect as many as a half a dozen to a square rod of tree surface. (May 26): The first report of serious damage to small grain, especially barley, came in on May 20 and 21, from southeastern and southwestern Missouri. At that time the worms were large enough to be literally destroying some barley fields. This morning the county agent at Springfield told me the armyworms were ruining barley in Greene County. The Sikeston area in southeastern Missouri, the Springfield area in southwestern Missouri, and the Joplin area in southwestern Missouri are badly overrun. Half-grown worms are doing serious damage to small grains, meadows, and pastures in the southern third of Missouri and similar injury is expected during the next two weeks throughout central and possibly northern Missouri.

Arkansas. D. Isely (May 20): The most extensive outbreak of armyworms on record in Arkansas came to a head during the last 2 weeks. The principal damage has been to winter oats. This injury has been most acute in eastern

and southeastern Arkansas. In a large part of this area all oat fields have been rather generally infested. In Arkansas County, where there are approximately 80,000 acres of winter oats, probably one-fourth of the crop was lost. Scattered injury has appeared in other counties of the northern part of the State. This injury is spotted, occurring only in occasional fields, and in spots within the fields. There has been some damage to row crops and pastures. Migrations of armyworms have usually been from oats to other crops. The outbreak is in Benton, Boone, Washington, Crawford, Franklin, Independence, Polaski, Lonoke, Prairie, Saint Francis, Monroe, Lee, Jefferson, Arkansas, Phillips, Lincoln, Desha, Drew, and Chicot Counties. It now seems to be well under control.

Fort Smith American (May 18): Crops in the immediate vicinity of Fort Smith, Sebastian County, are being damaged seriously by armyworms.

Oklahoma. C. F. Stiles (May 20): The true armyworm is present throughout the State. It is severely injuring all small grains, especially wheat, rye, and barley. This is the most severe outbreak Oklahoma has experienced. Wheat that a week ago would have made 40 bushels per acre is now not worth cutting, and the ravages continue unchecked. (May 27): Armyworms are devouring everything in northeastern Oklahoma.

F. A. Fenton (May 24): On May 13 a report was received of infestation from the true armyworm at Grandfield, Tillman County, in southwestern Oklahoma. Following this, calls for help were received from widely scattered counties--Jackson, Comanche, Cotton, Caddo, Grady, Garvin, and Jefferson-- in the southwestern part of the State. The infestation extends across Oklahoma into Osage County and to the Kansas border. The damage is mostly in wheat, but oats and barley are also being injured. The larvae are beginning to move out into row crops, mostly corn and cotton.

Texas. F. L. Thomas (May 17-21): Armyworms reported in wheat and causing injury in Wilbarger, Clay, and Grayson Counties on the Red River. They are about two-thirds grown.

FALSE WIREWORMS (Eleodes spp.)

South Dakota. H. C. Severin (May 21): The plains false wireworm (E. opaca Say) is extremely abundant in the drier areas of South Dakota and is doing much damage to wheat.

Nebraska. M. H. Swenk (May 12): The latest report of the season for the plains false wireworm was on May 12, when these pests were reported to be damaging the roots of wheat plants in Hitchcock County.

Idaho. C. Wakeland (May 25): Larvae of E. hispidulabris Say and E. extricata Say are injuring spring-planted and fall-planted wheat in dry-farming areas in eastern Idaho. A control district operating in Teton expects to distribute poisoned bait over an area of approximately 10,000 acres not treated last fall. Approximately 15,000 acres were poisoned last fall.

CORN

CORN EAR WORM (Heliothis obsoleta F.)

- Georgia. T. L. Bissell (May 25): A young peach orchard at Zebulon, central Georgia, has been attacked by larvae eating into the fruit. The orchard was planted in Austrian winter peas, which have just been turned under.
- Florida. H. T. Fernald (May 14): Young corn at Orlando has been badly attacked by what the farmers call the "budworm." I think it the corn ear worm and W. W. Yothers confirms this. The attacks were most severe the latter part of April.
- Alabama. J. M. Robinson (May 26): The corn ear worm is attacking cornstalks in Opelika.
- Mississippi. J. Milton (May 24): Tomatoes at Florence are being seriously damaged.
- Louisiana. L. O. Ellisor (May): The corn ear worm is seriously damaging tomatoes in the southern part of the State. Corn is also being damaged.
- California. J. Wilcox (May 10): A sixth-instar larva was swept from alfalfa at Artesia on May 4, and on May 10 larvae from first to fourth instar were found feeding on the leaves and tassels of corn at Vernon, Los Angeles County. Several eggs of the tomato fruitworm were found on tomato plants in the field in Orange and Los Angeles Counties, and a comparatively large number of moths emerged last week. Scattered emergence of moths has been taking place since February 19. On May 3 M. W. Stone found first- and fourth-instar larvae feeding on strawberries he had purchased at Stanton. (May 25): About 25 percent of the tassels in a field of early sweet corn at Vernon, Los Angeles County, are infested with larvae from first to fourth instar. The larger larvae had moved from the tassels to the newly formed ears. Sweet corn from Indio, Riverside County, on the market was found on May 17 to be infested. A full-grown larva was found in a green tomato at Costa Mesa, Orange County, on May 19. Moth emergence has continued heavy at Alhambra, Los Angeles County.

SUGARCANE BEETLE (Euethola rugiceps Lec.)

- Mississippi. C. Lyle (May 24): Complaints of serious damage to corn were received from Vaughn on May 4 and from Cruger on May 19.
- Louisiana. J. W. Ingram (May 18): Beetle injury to sugarcane began in March and reached its peak late in April and early in May in southern Louisiana. Injury is practically over now as few freshly injured plants can be found. Losses have been about the same as in 1936, which is below the average for the last 10 years. As in past years, injury was heaviest in the section west of the Atchafalaya River.

SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata F.)

- South Carolina. F. Sherman (May 24): At Florence in eastern part of State damage is considerable in low, heavy soils but not severe in uplands as reported by J. G. Watts.

Georgia. T. L. Bissell (May 14): Budworm injury to corn is noticeable at Experiment, in central Georgia. Larvae are about full grown.

Louisiana. C. E. Smith (May 20): Injury to corn at Baton Rouge by the larva occurred largely during the period from April 18 to 26. In some localized areas 75 percent or more of the stands were destroyed.

IMBRICATED SNOOT BEETLE (Epicaerus imbricatus Say)

Missouri. L. Haseman (May 26): Reported as doing serious damage to corn in the northwestern corner of the State. Present in scattered numbers in central Missouri.

CORN FLEA BEETLE (Chaetocnema pulicaria Melsh.)

Z. P. Metcalf (May 29): The corn flea beetle is occurring on corn throughout the State in more than usual abundance.

ALFALFA AND CLOVER

PEA APHID (Illinoia pisi Kltb.)

Virginia. A. M. Woodside (May 22): Alfalfa near Timberville has been very heavily infested by an aphid, presumably the pea aphid. Some stands were practically killed out.

Louisiana. C. L. Stracener (May): Pea aphid is still active.

Kansas. H. R. Bryson (May 23): The pea aphid occurred all over the State in alfalfa fields but the alfalfa has made sufficient growth to prevent injury. The population reached a relatively high point by the middle of May but is now receding.

W. T. Emery (May 18): This insect has been so scarce in Kansas since the fall of 1935 that no infestations or even individual specimens have been taken in extensive sweeping until this spring, when it is being found in abundance in alfalfa, around Manhattan.

Idaho. C. Wakeland (May 25): The pea aphid is fairly abundant on alfalfa in southwestern Idaho but is relatively scarce on adjacent peas, the earliest of which were in early blossom stage on May 18.

Utah. G. F. Knowlton (May 8): Pea aphids are becoming increasingly abundant in parts of northern Utah and less abundant in most of Cache and Morgan Counties. Second generation adults are now present on alfalfa. (May 27) Pea aphids continue to increase in abundance on alfalfa but are not yet seriously threatening the pea crop. Aphids were found to be the most abundant on peas at Mapleton Bench, in Uinta County, and at Layton, in Davis County.

Washington and Oregon. L. P. Richmond and M. M. Recher (April): I. pisi is somewhat more abundant than last year east of the Cascade Mountains in the Yakima and Columbia Valleys and in the irrigated sections of Umatilla County, Oreg. Fields in sandy areas and near the large rivers showed the highest populations and in these fields from 5 to 10 percent were already alates. No damaging populations were found. Coccinellid beetles were

much less abundant than last year.

Oregon. L. P. Richmond and M. M. Reeher (May 7): I. pisi showed a low winter survival on alfalfa after the long, dry fall and cold winter. The survival on fall-sown vetch and peas was very light and only a few fields came up in time to become infested last fall. Aphids increased slowly in April but it is believed that natural enemies will keep them in check. No damage to alfalfa and fall-sown legumes. No signs of migration from alfalfa to annual legumes, although alates are present at the rate of about 4 percent of the population on alfalfa in some fields and there have been a few warm days. Coccinellid adults, especially Coccinella trifasciata L., outnumber the aphids in some fields and there are many syrphid flies.

ALFALFA WEEVIL (Hypera postica Gyll.)

Utah. G. F. Knowlton (May 17): Adults are present in considerable numbers in many northern Utah localities, from 0.3 to 1.25 being taken per sweep of the insect net on alfalfa. Fifteen adults and some larvae were taken in 15 sweeps at Draper. (May 27): Alfalfa weevil injury is increasing, but is light to moderate in most of the fields examined in northern Utah.

Nevada. G. G. Schweis (May 25): Alfalfa weevils have been reported as hatching in great numbers in Douglas County. From observations in the field, it is believed that hatching is at least 2 weeks late.

California. A. E. Michelbacher (May 21): A survey of the alfalfa weevil situation on May 14 gave the following results: In the San Joaquin Valley the larval count per 100 sweeps of an insect net for different fields ranged from 7 to 210, while the adult count ranged from 15 to 37. In Pleasanton the larval count ranged from 43 to 330, and the adult count from 0 to 4. In the San Francisco Bay district the larval count ranged from 35 to 53, and the adult count from 0 to 1. On May 5, parasitization of the large larvae by Bathyplectes curculionis Thos. in the San Joaquin Valley averaged more than 90 percent, a marked increase over that found on April 28. In the most heavily infested field in Pleasanton parasitization was 86.5 percent, the lowest encountered this season. Parasitization in the San Francisco Bay district was greater than 90 percent, although on April 30 it dropped to 57 percent in the most heavily infested field, which was also suffering from neglect and delayed cutting.

CLOVER LEAF WEEVIL (Hypera punctata F.)

Ohio. T. H. Parks (May 24): The clover leaf weevil has been more abundant than usual in clover and alfalfa generally.

Indiana. J. J. Davis (May 27): The clover leaf weevil has been unusually abundant and caused considerable damage. The first specimens were received on May 7 from Lebanon in central Indiana. Since that time specimens have been received from localities over much of the State. Clover is the crop attacked, except in one report which mentioned alfalfa as the food.

Kentucky. W. A. Price (May 24): Damage to clover and young alfalfa plants was severe in many places in the State, particularly at Horse Branch, Shelbyville, Maysville, Lexington, and Louisville.

Michigan. E. I. McDaniel (May 26): The other day we received a quantity of clover leaf weevil from Eaton Rapids where it was attacking a large field of clover. About 20 acres of alfalfa clover was involved.

Iowa. C. J. Drake (May 19): The clover leaf weevil showed up in a number of counties in southeastern Iowa, but little commercial damage has been reported.

Kansas. H. R. Bryson (May 20): Reports from northeastern Kansas indicate that the clover leaf weevil is abundant.

GREEN CLOVER WORM (Plathypena scabra F.)

Virginia. A. M. Woodside (May 22): Alfalfa in the vicinity of Timberville was found to have a moderate infestation of the green clover worm.

Louisiana. L. O. Ellisor (May): The green clover worm was present on alfalfa throughout the winter in southern Louisiana. The caterpillars were not sufficiently abundant at any time to cause serious damage.

VETCH

VETCH BRUCHID (Bruchus brachialis Fahraeus)

North Carolina. J. S. Pinckney (May 31): Egg deposition by the vetch weevil began on May 19 at Salisbury, Rowan County, and has about reached its peak. Egg deposition is heavy and is general over all of the central part of the State. The first larva was found on May 24. Four new counties have been added to the distribution, viz., Burke, Caldwell, Polk, and Rutherford, infestations having been discovered on May 28.

SUGARCANE

SUGARCANE BORER (Diatraea saccharalis F.)

Louisiana. E. K. Bynum (May 18): The number of live borer stages found to have overwintered in replicated overwintering experiments, where treatments were similar, was several times greater this year than in 1936.

F R U I T I N S E C T S

CHERRY SCALE (Aspidiotus forbesi Johns.)

California. S. Lockwood (May 5): Yesterday Forbes scale was found by the writer on toyon in Yolo County. This, I believe, is the second report on the presence of this scale in California and represents to us a new county infested and a new host.

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

New York. D. W. Hamilton (May 24): Pupae were found as early as May 10 at Poughkeepsie; however, no emergence has occurred to date. A heavy second brood in many orchards in 1936 and a mild winter, with a minimum temperature of 40° F., indicates that a heavy flight of spring brood moths may be expected.

Pennsylvania. H. N. Worthley (May): Moths were first taken in bait pails on May 19 in south-central Pennsylvania and began to emerge in cages on the tree trunks on May 20. This is 9 days later than in 1936. Winter carry-over of larvae has been heavier than in recent years.

Delaware. L. A. Stearns (May 22): Pupation of over-wintered larvae on May 16 was 94 percent; first emergence of spring-brood moths in southern Delaware on May 6 and in northern Delaware on May 14; first moths collected in bait pans on May 13; first first-brood eggs deposited, May 16; no larvae hatched as yet. Development delayed a full week, as compared with 1936.

Virginia. A. M. Woodside (May 15): Moth emergence started late in Augusta County and has been slow. The first moths were taken in bait traps on May 15, although a few emerged in the lofts of packing sheds as early as May 10.

Georgia. C. H. Alden (May 22): Spring-brood emergence about over. First-brood eggs hatching and half-grown larvae noted in apples at Cornelia, northeastern Georgia.

Ohio. T. H. Parks (May 24): Adults were first caught in bait pans in Lawrence County, southern Ohio, on May 17, and at Columbus on May 23. With one or two exceptions, the nights have been too cool for egg laying and development is 10 days behind that of 1936.

Indiana. J. J. Davis (May 27): Codling moth wintered in large numbers, but the cold, wet weather prevailing up until a week or 10 days ago, has delayed emergence and egg laying. No emergence north of Lafayette, according to our observations. The first eggs hatched at Orleans on May 27.

L. F. Steiner (May 26): Spring-brood emergence, as indicated by bait trap captures at Vincennes began on May 9, but there was very little activity until May 17. Since then there has been a steady increase in moth abundance. Activity is now at, or very near, its peak. The first entrances were found today. In extreme southwestern Indiana adult activity apparently reached its peak on May 20. Moths now appear to be more abundant than at any time during the 1936 season.

Illinois. W. P. Flint (May 24): Adults are emerging over the entire southern half of the State. From present indications, the winter survival has been high and a heavy first brood is indicated.

Kentucky. W. A. Price (April 30): Our first record of moth emergence this season was on April 30 at Paducah.

Michigan. R. Hutson (May 20): Over 50 percent of codling moth have pupated in the vicinity of Shelby, Grand Rapids, and Fennville.

Missouri. L. Haseman (May 26): The peak of first-brood moth emergence is occurring in the Marionville district, southwestern Missouri. We are expecting the peak to be reached by the end of this week or the first of June in central Missouri and in the St. Joseph and Louisiana, Mo., areas.

Arkansas. D. Isely (May 20): Codling moths are unusually late this season, with no appreciable emergence in northwestern Arkansas until after May 1.

Washington. E. J. Newcomer (May 21): Emergence began on May 4 in Yakima County, but has been slow on account of cool weather. A few eggs were found on May 18. The season is about 2 weeks later than last year.

EASTERN TENT CATERPILLAR (Malacosoma americana F.)

Maine. F. H. Lathrop (May 19): Newly hatched larvae were observed on apple trees at Orono, in Penobscot County, on April 30. By May 12 the nests were beginning to be noticeable on wild cherry trees along the roadsides in Kennebec and Androscoggin Counties.

Vermont. J. V. Schaffner (May 24): Noticed caterpillars hatching on April 20 at Springfield. Infestations rather general and heavy in Bennington and Windham Counties.

Massachusetts. J. V. Schaffner (May 24): Apple and wild cherry trees are heavily infested in many localities through Berkshire, Franklin, Hampden and Worcester Counties. P. A. Berry reports that the tents are noticeable in the eastern part of the State.

Connecticut. W. E. Britton (May 13): Although abundant in some localities, in general throughout the State this insect is less abundant than in 1935 and 1936.

B. W. McFarland (May 13): Infestations at Bloomfield, East Granby, and Windsor are the worst that have been observed in these three localities during the last few years. Nests were found in three white pines and the caterpillars were attempting to feed on the trees.

J. V. Schaffner (May 24): The eastern tent caterpillar is abundant in many localities throughout the western half of Connecticut.

New York. R. D. Glasgow (May 22): Abundant again this spring in many parts of eastern New York. The so-called wilt disease of this caterpillar, reported from parts of Albany County somewhat later in the spring of 1936, is appearing in other parts of the county this year.

R. E. Horsey (May 11): Unusually abundant on apple, ornamental crab apple, flowering and fruit cherries, and wild plums at Rochester. First noted on May 2, when the caterpillars were $\frac{1}{4}$ inch long and webs $1\frac{1}{2}$ inches in diameter. Still hatching at this date, May 11. A ride through the country south of Rochester on May 9 found them numerous.

N. Y. State Coll. Agr. News Letter (May): The tent caterpillar is abundant in the apple-growing sections of both eastern and western New York.

Pennsylvania. H. N. Worthley (May 21): Tents are now conspicuous on wild cherry and neglected apple trees. Between State College and Gettysburg the infestation is not as heavy as in 1936.

Indiana. J. J. Davis (May 27): Again showing up in unusual numbers in some parts of the State; in fact, they are so abundant on some trees that food is scarce and disease is making quite an inroad.

PISTOL CASEBEARER (Coleophora malivorella Riley)

Pennsylvania. H. N. Worthley (May 21): Becoming increasingly abundant in south-central Pennsylvania. Overwintering larvae moved from the twigs to the opening buds in mid-April. Signs of their feeding are now common on the newly set apples and on tender terminal growth.

FLATHEADED APPLE TREE BORER (Chrysobothris femorata Oliv.)

Michigan. R. Hutson (May 20): Reports are coming in daily. We have recently heard of infestations in Battle Creek, Vestaburg, Grand Rapids, Howell, Lansing, and Cassopolis.

Nebraska. M. H. Swenk (May 24): Complaints of damage to fruit and shade trees continued to be received last month. The hosts were chiefly apple, elm, and cherry trees.

Oklahoma. F. A. Fenton (May 24): Damage has been reported from Ponca City, Chickasha, Shawnee, Wilburton, and Kingfisher.

FRUIT APHIDS (Aphididae)

Maine. F. H. Lathrop (May 19): A few recently matured adults of Rhopalosiphum prunifoliae Fitch were found on an apple tree in Monmouth, Kennebec County on May 12. This species is very scarce on apple trees in this section. Newly hatched nymphs of A. pomi Deg. appeared on apple buds at Monmouth, in Kennebec County, during the week ended April 30. This species seemed to be slightly more abundant than usual. Small colonies could be found on apple buds in commercial orchards. Cold, rainy weather during the first 2 weeks in May reduced the number of aphids. By May 15 they were difficult to find.

Connecticut. P. Garman (May 19): Amuraphis rosae Baker is unusually scarce in New Haven County.

New York. N. Y. State Coll. Agr. News Letter (May): Fruit aphids in general are less abundant than usual throughout the State. Ladybird beetles have been noted in great abundance. The percentage of rosy aphids to the other two species is higher than usual, and the first-named species is somewhat abundant in isolated infestations.

Indiana. J. J. Davis (May 27): Rosy apple aphid is reported by G. E. Marshall as increasing rapidly at Orleans and doing considerable damage.

Michigan. R. Hutson (May 20): Orchard surveys indicate the rosy apple aphid is comparatively scarce in all apple-growing sections.

Wisconsin. C. L. Fluke (May 20): Aphids in general not numerous this spring. The green apple aphid and the apple grain aphid are unusually scarce in Crawford, Dane, and Door Counties.

Kentucky. W. A. Price (May 24): Some rosy aphid is reported at Paducah.

Missouri. L. Haseman (May 26): Aphids on apple trees have been exceptionally scarce this spring.

Arkansas. D. Isely (May 20): Some injury by rose aphids on apples in a few orchards.

Idaho. C. Wakeland (May 25): The green apple aphid is very abundant on apples in Twin Falls County, south-central Idaho. Natural enemies are abundant.

LEAFHOPPERS (Cicadellidae)

Maine. F. H. Lathrop (May 19): Newly hatched nymphs of Typhlocyba pomaria McAtee were observed on the under side of apple leaves near Monmouth on May 12.

New York. N. Y. State Coll. Agr. News Letter (May): The first nymphs of T. pomaria were observed on May 6 and 10 in the Hudson River Valley and on May 17 and 20 in western New York.

Connecticut. P. Garman (May 19): Nymphs of the white apple leafhopper are present in about the usual numbers in some orchards in New Haven County. Scarce or absent in others.

Indiana. J. J. Davis (May 27): Leafhoppers are abundant on apples. The first nymphs were observed by G. E. Marshall at Orleans May 24.

Kentucky. W. A. Price (May 24): Leafhoppers are more abundant than usual at this time of year in orchards in the Paducah area. The species most abundant are Erythroneura obliqua Say and E. lawsoniana Bak.

Missouri. L. Haseman (May 26): Apple leafhoppers are much less abundant than for the last several years.

EUROPEAN RED MITE (Paratetranychus pilosus C. & F.)

Connecticut. P. Garman (May 19): European red mite generally scarce throughout New Haven County.

Pennsylvania. H. N. Worthley (May 21): In Adams County (south-central Pennsylvania) first-generation mites are mature, and the first eggs were seen on apple leaves on May 17. The mites are moderately abundant where dormant control measures were omitted. At State College (central Pennsylvania) the mites are very abundant on unsprayed trees. Eggs have not yet been observed.

PEACH

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Maine. F. H. Lathrop (May 19): Overwintered adults were active in hibernation cages at Monmouth on May 11.

Delaware. L. A. Stearns (May 22): First overwintered adults collected by jarring at Bridgeville on April 23, which was also the peak of emergence to date.

Georgia. O. I. Snapp (May 19): The curculio infestation at Fort Valley (central Georgia) is very light. It is perhaps the lightest infestation in the 18 years during which this insect has been under observation in central Georgia by me. This is believed to be due to the lighter than usual carry-over of adults and to the high mortality during hibernation. The first full-grown larvae began to leave peach drops on May 14, which is from 2 to 3 weeks later than usual.

C. H. Alden (May 22): First-brood larvae full-grown, leaving the peaches, and making cases in the soil at Cornelia.

Missouri. L. Haseman (May 26): No evidence of the plum curculio has shown up at Columbia or Clarksville.

SHOT-HOLE BORER (Scolytus rugulosus Ratz.)

Idaho. R. W. Haegele (April 27): Infestations in peach, prune, and apricot are becoming common in Gem and Canyon Counties, in southwestern Idaho.

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Delaware. L. A. Stearns (May 22): Pupation of overwintered larvae on April was 100 percent; first emergence of spring-brood moths in southern Delaware on April 17 and in northern Delaware on May 1; first moths collected in bait pans on May 2; peak of emergence, May 6; first first-brood eggs deposited, May 10; first larvae hatched, May 17; no twig injury observed as yet.

Georgia. O. I. Snapp (May 6): The first twig injury of the season was observed at Fort Valley (central Georgia) on May 6. The oldest larvae were about three-fourths grown. Eggs of the spring-brood moths began to hatch a little later than usual. The dates of first twig injury at Fort Valley in other years are as follows: April 10, 1925; April 20, 1926; April 1, 1927; April 25, 1928; April 4, 1929; April 29, 1930; April 22, 1931; May 17, 1932; April 20, 1933; April 24, 1934; April 3, 1935; and April 16, 1936.

Mississippi. C. Lyle (May 24): Injury to peach twigs is conspicuous for its scarcity this year. An orchard at State College which had nearly every twig infested in 1936 has no sign of injury this season.

PEACH BORER (Conopia exitiosa Say)

Georgia. O. I. Snapp (May 19): Orchards in the vicinity of Fort Valley (central Georgia) have been examined regularly, but there has been no pupation to date. The infestation is about average for this locality.

LESSER PEACH BORER (Synanthedon pictipes G. & R.)

Georgia. O. I. Snapp (May 19): There is an average infestation in old somewhat neglected orchards at Fort Valley. The spring-brood emergence is completed and first-brood larvae are now abundant in the trees.

GREEN PEACH APHID (Myzus persicae Sulz.)

Idaho. C. Wakeland (May 25): In Twin Falls County, south-central Idaho, the green peach aphid is very abundant on peaches. Natural enemies are very abundant.

GREEN STINKBUG (Acrosternum hilaris Say)

California. S. Lockwood (April 30): The green stinkbug, locally known as the green soldier bug, is again damaging peach orchards in Merced and Fresno Counties. Inspection showed that this damage is confined to feeding punctures caused by adults.

PEAR

PEAR PSYLLA (Psyllia pyricola Foerst.)

Connecticut. P. Garman (May 19): Present in usual numbers in New Haven County.

New York. N. Y. State Coll. Agr. News Letter (May): The pear psylla is present in most orchards in the Hudson River Valley but is developing slowly. Reports indicate that the insect is more abundant in western New York.

CHERRY

BLACK CHERRY APHID (Myzus cerasi F.)

Idaho. C. Wakeland (May 25): In Twin Falls County, south-central Idaho, the black cherry aphid is very abundant on sweet cherries. Natural enemies are very abundant.

PLUM

RUSTY PLUM APHID (Hysteroneura setariae Thos.)

Mississippi. C. Lyle (May 24): Specimens received from Magnolia on May 3 and from Vicksburg on May 21, both infestations being on plums.

Missouri. L. Haseman (May 26): The rusty plum louse has been very abundant for the last three weeks throughout much of the State on certain varieties of plums.

Oklahoma. F. A. Fenton (May 24): The brown plum aphid was reported as being very injurious to plums in Oilton and Stillwater.

BERRIES

RASPBERRY ROOT BORER (Bembecia marginata Harr.)

Montana. H. B. Mills (May 10): On raspberry roots in Flathead County.

Washington. W. W. Baker (May 8): At Puyallup many of the larvae have passed into the second instar and have been feeding on the new cane shoots which just started to grow and have caused serious damage by cutting down the possible new canes for 1937.

RASPBERRY FRUITWORM (Byturus unicolor Say)

Washington. W. W. Baker (May 6): The beetle was found in only one of four fields on a farm near Gardiner, in the northwestern corner of Jefferson County (30 acres of loganberries). This is our first positive record of the occurrence of the insect on the Olympic Peninsula. Damage was

not extensive. The first eggs were found on thimbleberry on May 11 at Puyallup, on native dewberry on May 12, and on raspberry on May 13.

SNOWY TREE CRICKET (Oecanthus niveus Deg.)

Utah. G. F. Knowlton (April 26): Snowy tree cricket eggs are abundant in raspberry stems in some patches at Brigham, in northern Utah.

CRANBERRY

BLACK-HEADED FIREWORM (Rhopobota naevana Hbn.)

Wisconsin. E. L. Chambers (May 25): The overwintering eggs of the black-headed fireworm were observed beginning to hatch in the vicinity of Wisconsin Rapids on May 19.

GRAPE

GRAPE LEAFHOPPER (Erythroneura comes Say)

Delaware. L. A. Stearns (May 19): First appearance of overwintered adults in vineyards on this date, at Camden.

Mississippi. D. W. Grimes (May 24): Slight injury to grapes at Durant.

Oklahoma. F. A. Fenton (May 24): The grape leafhopper was reported from Ravia and Grove.

Arizona. C. D. Lebert (May 21): Slight injury is becoming apparent on grape plants all over the Salt River Valley.

Idaho. J. R. Douglass (May 22): Complaints of E. comes ziczac Walsh on grapes and Virginia creeper have been received.

Utah. G. F. Knowlton (May 18): Grape leafhoppers were abundant on strawberry and grape foliage at Farmington, in northern Utah. Some damage to the latter host is already evident at Farmington and Logan.

California. C. S. Morley (May 6): Vineyardists in Kern County are doing considerable spraying for control of grape leafhoppers.

GRAPE LEAF FOLDER (Desmia funeralis Lbn.)

California. H. C. Donohue (May 7): The first adult noted this season was taken in a trap on May 3 at Fresno.

EIGHT-SPOTTED FORESTER (Alasia octopunctata F.)

Missouri. L. Haseman (May 26): Half-grown larvae are causing considerable damage to the terminal growth of unsprayed grapes at Columbia.

Kansas. H. R. Bryson (May 22): The moths of this species are numerous in Manhattan this spring. Several moths have been taken on strawberry blossoms.

PECAN

PECAN CIGAR CASEBEARER (Coleophora caryaefoliella Clem.)

Mississippi. G. L. Bond (May 7): A heavy infestation of this insect on pecan was observed in Jackson County.

PECAN LEAF CASEBEARER (Acrobasis juglandis LeB.)

Texas. F. L. Thomas (April 23): On pecan at Waelder, Gonzales County.

OBSURE SCALE (Chrysomphalus obscurus Comst.)

Mississippi. N. L. Douglass (May 24): Obscure scale is rather general in the Delta.

CITRUS

GREEN CITRUS APHID (Aphis spiraecola Patch)

Florida. J. R. Watson (May 22): The citrus aphid has partially recovered from the infection of Empusa, which controlled it in April, but the infestations are not severe. The Chinese ladybeetle (Leis sp.) has become established in Polk County. It has spread from Orange County into Osceola and Seminole Counties.

CITRUS THRIPS (Scirtothrips citri Moul.)

California. C. S. Morley (May 6): Citrus growers are spraying and dusting for control of citrus thrips, in Kern County.

CITRUS RUST MITE (Phyllocoptes oleivorus Ashm.)

Florida. J. R. Watson (May 22): Rust mites have been troublesome to citrus.

SIX-SPOTTED MITE (Tetranychus sexmaculatus Riley)

Florida. H. T. Fernald (May 24): Has appeared lately in rather unusual abundance around Orlando.

TRUCK - CROP INSECTS

SEED CORN MAGGOT (Hylemyia cilicrura Rond.)

Maryland. C. F. Andrus (May 31): From 16.5 to 60.0 percent of the seedlings in two $\frac{1}{4}$ -acre plots of beans planted on May 4 at Beltsville were destroyed by an unusually concerted attack of seed corn maggots. Counts made on May 20, based on a total of 2,607 plants from small samples, showed an average of 32.5 percent destroyed in one plot and 38 percent in the other. The above percentages of damage represent only seedlings in which the primary leaves were completely destroyed. A large proportion of the remaining plants showed various degrees of injury, as did also the seedlings that had not yet emerged above the soil on the date of observation. It is estimated that not less than 70 percent of the early seedlings in these two plots were infested in some degree. Seed planted 1 week later in the first plot produced seedlings only 10.5 percent of which were seriously damaged by the maggot. Of 869 seedlings counted, only 93 were completely decapitated.

Virginia. H. G. Walker and L. D. Anderson (May 25): Rather abundant early in the spring but has done little damage in the Norfolk district.

Kentucky. W. A. Price (May 24): Seed corn maggots are causing much loss to early planted corn, cucumber, and melon seed.

Missouri. L. Haseman (May 26): During the first half of May numerous complaints were received of scattered heavy infestation of garden peas, melons, cucumbers, beans, and corn.

Nebraska. M. H. Swenk (May 24): Numerous complaints of damage were received from southeastern Nebraska during the latter half of May.

Kansas. H. R. Bryson (May 24): Several reports of this insect have been received. It has been reported attacking planted corn, kafir, melons, and beans. Soil conditions during the early part of the month were not favorable to the germination of seed.

Oklahoma. F. A. Fenton (May 24): The seed corn maggot was reported injuring corn at Okmulgee and McAlester.

Utah. G. F. Knowlton (May 17): Seed corn maggot flies are very abundant in northern Utah in nearly all localities.

Washington. W. W. Baker (May 25): Peas, at Auburn, King County, planted on cabbage and cauliflower ground about a week after the first crops were plowed under, are so severely damaged that the operators think they will have to replant in order to obtain a profitable stand. Estimate of damage by grower, 35 percent.

SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata F.)

Alabama. J. M. Robinson (May 26): The 12-spotted cucumber beetle is moderately abundant in gardens in central and southern Alabama.

Louisiana. H. L. Dozier (May 17): D. 12-punctata and D. balteata Lec. are very abundant on dahlia foliage and bloom on this date, at Opelousas.

Kansas. H. R. Bryson (May 25): The first adults put in their appearance at Manhattan on May 14. Several beetles were taken on that day.

POTATO FLEA BEETLE (Epitrix cucumeris Harr.)

North Carolina. W. A. Shands (May 25): Light-to-moderate injury to field corn, and moderate-to-severe injury to sweet corn at Oxford, north-central North Carolina. In one garden it was necessary to dust sweet corn three times in May.

STRIPED CUCUMBER BEETLE (Diabrotica vittata F.)

Virginia. H. G. Walker and L. D. Anderson (May 25): The striped cucumber beetle is rather abundant at Norfolk.

Ohio. N. F. Howard (May 27): H. C. Mason reports that the striped cucumber beetle was present on early cucumbers, melons, and squash at South Point.

Louisiana. P. K. Harrison (May 13): The first beetles were observed today, May 13. A squash plant is being severely injured.

GREEN PEACH APHID (Myzus persicae Sulz.)

New Jersey. M. D. Leonard (May 6): One hundred acres of newly set cabbage plants badly infested at Blackwood.

Maryland. E. N. Cory (May 25): Heavy infestation on winter spinach and light infestation on spring spinach in Baltimore County on May 12.

California. J. Wilcox (April 14): Both winged and nymphal forms were common in a young tomato field at San Onofre, San Diego County. A serious infestation was found in Peter's Canyon (Orange County) on April 14.
(Det. by G. F. Knowlton.)

SOUTHERN GREEN STINKBUG (Nezara viridula L.)

Mississippi. C. Lyle (May 24): Reported by G. L. Bond as causing severe damage to young corn on May 7 at Moss Point. Many bugs were also found on tomatoes. Specimens taken on turnips, English peas, and Irish potatoes were received from Summit and Brookhaven the last of April.

A LYGAEID (Geocoris bullatus Say)

Nebraska. M. H. Swenk (May 18): The big-eyed false chinch bug was heavily infesting radishes, peas, lettuce, and beets in a garden in Hayes County

POTATO AND TOMATO

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

Maryland. G. Myers (May): Adult Colorado potato beetles are occurring in moderate abundance on potato at Avery, 2 miles east of Rockville. An egg mass was observed on May 26.

Virginia. H. G. Walker and L. D. Anderson (May 25): Scarce to abundant in eastern Virginia.

North Carolina. Z. P. Metcalf (May 29): Normally abundant in the eastern half of the State.

Florida. A. H. Madden (May 18): Both larvae and adults abundant at Quincy.

Alabama. O. T. Deen (May): Very little injury to potatoes this season, along the Gulf coast. Adults were noticed in the field on March 31. Only one spraying was necessary for most growers, whereas last season it was necessary to spray or dust at least two or three times.

Mississippi. C. Lyle (May 24): Has been very abundant in nearly all parts of the State this spring, Plant Board inspectors reporting many complaints of injury to potatoes and tomatoes.

POTATO FLEA BEETLE (Epitrix cucumeris Harr.)

Connecticut. N. Turner (May 15): In southern Connecticut beetles attacked potatoes as soon as they sprouted.

Utah. G. F. Knowlton (May 22): Potato flea beetles are seriously damaging young tomato foliage in parts of Carbon County.

WESTERN SPOTTED CUCUMBER BEETLE (Diabrotica soror Lec.)

California. J. Wilcox (May 5): Adults quite common, eating leaves of tomatoes in San Juan Capistrano, Orange County.

TOMATO PINWORM (Gnorimoschema lycopersicella Busck)

Florida. J. R. Watson (May 22): Doing severe damage in Manatee and Sarasota Counties. In one field they had infested over 50 percent of the tomatoes; however, the shipping season is over in this section and none of the infested tomatoes are being shipped.

California. J. C. Elmore (May 22): An early tomato field at San Onofre, San Diego County, infested by leaf folders. No fruit injury was observed. Tomato vines in fields of tomatoes in the Vista area generally infested.

BEET ARMYWORM (Lanhygma exigua Hbr.)

California. J. Wilcox (May 5): Doing considerable damage to tomato plants about 1 foot in spread at San Juan Capistrano, also damaging tomato plants in an outdoor seed bed at Riverside on April 30.

ALFALFA LOOPER (Autographa californica Speyer)

California. J. C. Elmore (May 22): Larvae are quite numerous on the leaves of early tomatoes at San Onofre, San Diego County. Fruit injury was not observed. This infestation is heavier than usual.

J. Wilcox (May 4): A large percentage of eggs found on tomato plants at Costa Mesa, Orange County, the last 2 weeks are hatching into the looper Autographa sp., which is expected to do considerable damage. A nearly full-grown larva of A. californica was taken on alfalfa at Artesia on May 4.

BEANS

MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

New Jersey. E. Kostal (May 28): A few adults noted on garden patches in Monmouth County on May 22, which is about the average date in this locality.

Virginia. A. M. Woodside (May 23): The first beetle observed this season was jarred from a peach tree in Allemanle County on May 3. This seems early in comparison with other seasons.

Ohio. N. F. Howard (May 27): Survival in the hibernation cages at Columbus is the heaviest for several years. On May 26 approximately 15 percent of the beetles had emerged in the standard cages at Columbus. In the field, the beetles are not as abundant as in some years, owing to the fact that smaller numbers entered hibernation after the unfavorable, dry season of 1936. H. C. Mason found the first beetle in the field at Columbus on May 23 and the first at South Point on May 4. Eggs were found on May 17 at South Point.

Georgia. T. L. Bissell (May 4): First beetle of season feeding on bean at Griffin, central Georgia. (May 31): Destructive on stringbeans at Experiment. Eggs being laid and a few larvae present.

Alabama. J. M. Robinson (May 26): The Mexican bean beetle continues to be active in central and northern Alabama.

Georgia. T. L. Bissell (May 14): Numerous beetles laying eggs and feeding on leaves of string beans in a small garden at Thomasville on May 10. Injury

appreciable. E. borealis F. was associated with the Mexican bean beetles on the beans but did not seem to be feeding.

C. H. Alden (May 22): Found a large number of overwintering beetles on the beans but no eggs and larvae to date at Cornelia.

Colorado. R. L. Wallis (May 21): An average of records of weekly examination during May of beetles in hibernation cages show that there was a winter mortality of 93.04 percent at Grand Junction.

BEAN LEAF BEETLE (Cerotoma trifurcata Forst.)

Ohio. N. F. Howard (May 27): Moderately abundant at South Point but not as injurious as in 1936.

South Carolina. W. C. Nettles (May 21): Quite destructive in the bean-growing sections of the coast, control measures being necessary early in May.

Georgia. T. L. Bissell (May 14): Much damage to beans and cowpeas by adults at Experiment.

Mississippi. C. Lyle (May 24): The bean leaf beetle has been generally abundant over Mississippi this season.

Texas. F. L. Thomas (April 26): The bean leaf beetle is causing injury at Millican, in Brazos County.

CABBAGE

IMPORTED CABBAGE WORM (Ascia rapae L.)

Virginia. H. G. Walker and L. D. Anderson (May 25): Imported cabbage worms are relatively scarce near Norfolk, but white butterflies are rather abundant in many fields of cabbage.

Florida. H. T. Fernald (May 13): Butterflies unusually abundant near Orlando. Most cabbage and cauliflower has been harvested and the butterflies are laying eggs on the rejected plants left in the fields.

DIAMONDBACK MOTH (Plutella maculipennis Curt.)

Utah. G. F. Knowlton (May 17): Adults are abundant throughout northern Utah, particularly on mustards of various kinds. Larvae are webbing white top in many localities, reducing the production of seed in this weed.

Colorado. G. M. List (May 22): The diamondback moth has been very numerous in all the northeastern quarter of Colorado since April 28. The larval population was below normal in this section last fall and indications are that a migration may be responsible for this sudden increase. Larvae are becoming numerous on wild and cultivated Cruciferae.

CABBAGE LOOPER (Autographa brassicae Riley)

New York. R. W. Leiby (May 20): Loopers observed in small numbers in a few fields of newly set cabbage, but they are absent in most fields in Onondaga County.

Virginia. H. G. Walker and L. D. Anderson (May 25): Very scarce at Norfolk.

CABBAGE MAGGOT (Hylemyia brassicae Bouche)

New York. R. W. Leiby (May 20): Treatments for control are being generally applied. Eggs being laid in average abundance.

Ohio. N. F. Howard (May 27): The cabbage root maggot damaged a small planting of early cabbage on Ohio State University Farm on May 23, and is reported to be present in the vicinity of Columbus. No cabbage root maggots were observed on early cabbage at South Point on May 17.

CABBAGE APHID (Brevicoryne brassicae L.)

Maryland. E. N. Cory (May 14 and 25): Cabbage aphid attacking cabbage at Brookville.

Virginia. H. G. Walker and L. D. Anderson (May 25): The cabbage aphid has been rather abundant on seed-kale plants this spring, but is very scarce on cabbage at Norfolk.

Ohio. N. F. Howard (May 27): Cabbage aphid was present on cabbage in the Ohio River Valley on May 17, but is not as abundant as the previous week, probably because of heavy rains.

Indiana. J. J. Davis (May 27): Cabbage aphid was reported damaging cabbage at Deputy on May 12.

Kentucky. W. A. Price (May 24): Cabbage aphids have been the source of many inquiries during the past month.

Missouri. L. Haseman (May 26): The cabbage louse is being reported frequently as serious on cabbage throughout the State.

Nebraska. M. H. Swenk (May): Complaints of the cabbage aphid on cabbage plants were received from Saline County on May 19 and from Johnson County on May 20.

Kansas. H. R. Bryson (May 27): Cabbage aphids are more numerous than usual this spring in Riley County. Some injury has been done.

A WEEVIL (Ceutorhynchus assimilis Payk.)

Washington. W. W. Baker (May 7): Present in fair numbers on weed mustard at Lower Elwha, Clallam County. A small patch of weed mustard near the eastern limits of Sequim, Clallam County, was heavily infested. This is our first record for the Olympic Peninsula.

ASPARAGUS

ASPARAGUS BEETLE (Crioceris asparagi L.)

New York. R. W. Leiby (May 20): Present in average numbers and causing some damage over the State.

New Jersey. E. Kostal (May 28): Crioceris asparagi and C. duodecimpunctata L. are exceptionally numerous near Morganville, Monmouth County. Eggs and larvae of C. asparagi have been noted regularly on New Jersey asparagus in New York market.

Maryland. E. N. Cory (May 13): Attacking asparagus in Prince Georges and Montgomery Counties. Generally reported as serious in Kent and Talbot Counties.

Washington. E. W. Jones (May 24): The asparagus beetle is much less abundant this spring than last. On May 24, a few adults, eggs, and full-grown larvae were taken in several fields at Walla Walla. Low winter temperatures (January mean, 14° F.) have probably given some control of this pest.

PEAS

PEA APHID (Illinoia pisi Kltb.)

Delaware. L. A. Stearns (May 20): Moderate infestation just prior to bloom in Nassau, Sussex County, and Dover, Kent County.

Maryland. E. N. Cory (May 26): Heavy infestations in Talbot, Wicomico, Worcester, Dorchester, and Prince Georges Counties. Lighter infestation in Caroline. Record for Eastern Shore: April 27, heavy infestation on alfalfa at Ridgely and scattered infestation on peas; May 4, infestation general on peas, averaging from 5 to 6 per plant on the shore; May 11, generally more numerous, but few noticeable clusters. Only a few fields slightly injured; May 15, had multiplied rapidly since May 11; May 18, considerable clustering, plants showing injury in places. Record for western Maryland: May 21, week's survey did not indicate any signs of outbreak in Harford, Carroll, and Frederick Counties; May 26, outbreak near Gaithersburg in Montgomery County.

G. Myers (May 28): An outbreak of the pea aphid is occurring in large fields of canning peas between Rockville and Norbeck.

Virginia. H. G. Walker (May 25): The pea aphid has been very destructive to peas during the past month in the eastern part of Virginia. However, a fungous disease, predators, and other factors have greatly reduced its numbers and it is becoming rather scarce.

Ohio. N. F. Howard (May 17): The pea aphid is not now very abundant on a planting of peas at South Point but it was abundant last week. Natural control was probably due to heavy rains. Coccinellids becoming numerous and first-generation larvae are pupating. The planting was seriously injured, the tips of the plants being malformed and stunted.

Wisconsin. C. L. Fluke (May 20): Pea aphid is very scarce in Dane County.

Kansas. J. R. Horton (May 21): Aphids moderately numerous, somewhat more so than usual in recent years near Wichita. Very few winged forms yet. Predators and parasites numerous. Damage light.

Texas. S. W. Clark (May 29): I. pisi found on bur clover and sweet clover at Weslaco, Hidalgo County, in the lower Rio Grande Valley.

Utah. G. F. Knowlton (May 17): Becoming increasingly abundant on alfalfa, and winged females are moving to canning peas in northern Utah. Thirteen winged females and 11 nymphs were collected in 50 sweeps of an insect net on peas north of Layton. (May 21): Fourth-generation aphids are now coming on in some pea fields on Mapleton Bench.

California. S. Lockwood (May 25): The pea aphid was very abundant in the Imperial Valley earlier in the season but has largely subsided.

A THRIPS (Frankliniella ameliae Hood)

Texas. F. L. Thomas (May 24): S. W. Clark reported these thrips attacking English peas in fields of Hidalgo and Cameron Counties in the lower Rio Grande Valley, January 12. Eggs were laid in the pods. The species is rather rare in the United States, although previously reported from Texas, according to J. R. Watson.

SQUASH

SQUASH BUG (Anasa tristis Deg.)

Virginia. H. G. Walker and L. D. Anderson (May 25): Squash bugs are present and laying eggs, but they are not very numerous at Norfolk.

South Carolina. W. C. Nettles (May 21): Squash bug was reported to be destructive in Hampton County on May 19.

Mississippi. D. W. Grimes (May 24): Some injury to squashes at Durant is reported.

Louisiana. C. O. Eddy (May 24): Squash bugs have been abundant for 10 days.

EGGPLANT

EGGPLANT LACEBUG (Gargaphia solanii Heid.)

Mississippi. L. J. Goodgame (May 24): Injury to eggplants at Aberdeen is reported.

ONIONS

A PLANT BUG (Labopidea allii Knight)

Kansas. H. R. Bryson (May 21): Doing considerable damage to spring onions throughout the eastern half of the State. The tops of the onions turn brown and wilt down.

Oklahoma. C. F. Stiles (May 20): A new onion pest has made its appearance throughout the State. This is a sucking insect closely related to the tarnished plant bug. (This note is being placed under L. allii by the Insect Pest Survey as the probable species, awaiting identification.)

ONION THRIPS (Thrips tabaci Lind.)

New York. N. Y. State Coll. Agr. News Letter (May 3): Rather serious injury to greenhouse-grown cucumbers in Rochester observed on April 30.

Virginia. H. G. Walker and L. D. Anderson (May 25): Thrips are rapidly becoming very abundant on cabbage and onions at Norfolk.

STRAWBERRY

STRAWBERRY LEAF ROLLER (Agallia comptana Froel.)

Utah. G. F. Knowlton (May 8): Ninety-five percent of the strawberry leaf rollers at North Ogden are now adult.

STRAWBERRY WEEVIL (Anthonomus signatus Say)

Delaware. L. A. Stearns (April 30): Moderate infestation in early to full-bloom strawberries at Laurel, Sussex County.

PEPPER

PEPPER WEEVIL (Anthonomus eugenii Cano)

Florida. J. R. Watson (May 22): The pepper weevil was found in three abandoned pepper fields in Manatee County. Scouting of the surrounding counties had negative results. Infestation in Sarasota County cleaned up.

SWEETPOTATO

POTATO APHID (Illinoia solanifolii Ashm.)

Louisiana. H. L. Dozier (April 29): For the past week this aphid has been increasing in extremely abundant numbers on sweetpotato plants in greenhouse germination test plots at Opelousas. (Det. by P. W. Mason.)

TORTOISE BEETLES (Cassidinae)

Mississippi. C. Lyle (May 25): Chelymorpha cassidea F., Jonthonota nigripes Oliv., and Metriona bivittata Say are very numerous on sweetpotatoes at Corinth.

Louisiana. H. L. Dozier (May 17): Sweetpotato vines are being generally attacked by tortoise beetles at Opelousas. Injury to foliage quite noticeable.

SUGAR BEETS

BEET LEAFHOPPER (Eutettix tenellus Bak.)

Idaho. J. R. Douglass (May 24): The spring brood of leafhoppers in south-central Idaho is comparatively large owing to the moderately high spring population of overwintered leafhoppers and an abundance of favorable host plants on which to reproduce. The warm, dry weather of May has been favorable for the early development of the spring brood; therefore the migration into the cultivated areas will begin about June 1 and should reach the peak about June 18. Already there are a few overwintered leafhoppers within the cultivated area but this is a normal occurrence, as a few of the insects remain within the cultivated area each winter.

Utah. G. F. Knowlton (May 17): Beet leafhoppers were rather abundant on sugar beets west of Provo and less abundant at Plain City, in northern Utah.

H. E. Dorst (May 25): Large long-distance migration of beet leafhoppers from southern Utah, southern Nevada, and northern Utah, extended from Richfield to the Idaho State line on the north. Migration of April 23 to May 20 reached the beets while they were in the cotyledon stage and reached the tomato-growing district from Payson to Garland during planting time.

BEAN APHID (Aphis rumicis L.)

California. A. E. Michelbacher (May 21): An aphid believed to be A. rumicis was doing serious injury to a sugar-beet planting near Stockton on May 7. The beets were literally covered with the pest.

HOP FLEA BEETLE (Psylliodes punctata Melsh.)

Utah. G. F. Knowlton (May 22): Hop flea beetles are damaging sugar beets in northern Utah and injury to young seedlings is reported as very severe in Gunnison Valley. Replanting due to this cause is reported in a number of instances.

TOBACCO

TOBACCO HORNWORMS (Protoparce spp.)

North Carolina. J. P. Vinzant (May 25): First eggs observed this year were found on tobacco in the field on May 24 at Oxford.

Florida. A. H. Madden (May 10): P. sexta Johan. eggs and larvae are becoming numerous in a few fields of sun-grown tobacco in Gadsden County.

CORN ROOT WEBWORM (Crambus caliginosellus Clem.)

Tennessee. L. B. Scott (May 25): The so-called tobacco wireworm is present on tobacco in about normal numbers in Montgomery County.

TOBACCO FLEA BEETLE (Epitrix parvula F.)

North Carolina. Z. P. Metcalf (May 29): The tobacco flea beetle is about as abundant in the entire State as it was last year.

South Carolina. W. C. Nettles (May 21): Considerable damage was apparent early in May in the Pee Dee district but diminished about May 20.

Florida. F. S. Chamberlin (June 1): The second brood of tobacco flea beetles has emerged in Gadsden County and appears to be more abundant than usual.

Tennessee. L. B. Scott (May 8): Less numerous than usual in western Tennessee with very slight damage. (May 25): Present in less than normal numbers in northwestern Tennessee. Has increased slightly since May 20 but damage in tobacco plant beds is negligible.

Kentucky. W. A. Price (May 24): Flea beetles in tobacco beds have been moderately common.

POTATO FLEA BEETLE (Epitrix cucumeris Harr.)

Massachusetts. A. W. Morrill (May 15): Tobacco seedlings in seedbeds attacked in localized areas. Affected plants severely damaged. First severe case noted this season at Southwick, Hampden County.

TOBACCO THRIPS (Frankliniella fusca Hinds)

Florida. F. S. Chamberlin (May 12): Owing to heavy rains during the first part of May, very few thrips are present in the tobacco fields of this region (Gadsden County). No damage to date.

APHIDS (Aphididae)

Tennessee. L. B. Scott (May 25): Aphid (undetermined) has caused many complaints from growers near Springfield. The damage is not severe but very noticeable in many plant beds. The presence of aphids on tobacco in this section is rather unusual.

GARDEN FLEA HOPPER (Halticus citri Ashm.)

Florida. F. S. Chamberlin (May 17): This insect is much less abundant on tobacco than normal. Damage slight in Gadsden County. (Det. by H. G. Barber.)

COTTON INSECTS

BOLL WEEVIL (Anthonomus grandis Boh.)

South Carolina. F. F. Bondy and C. F. Rainwater (May 15): Weevils in Florence County are emerging in the fields in apparently larger numbers than for the past 3 years. The average of all fields examined was 145 weevils per 10,000 plants. (May 29): The following table, giving the emergence of boll weevils in the hibernation cages at Florence for the past 6 years, shows that the 1936-37 winter mortality was not as high as during the previous 3 winters.

Date	Boll weevil emergence in--					
	1932	1933	1934	1935	1936	1937
	Number	Number	Number	Number	Number	Number
May 2-15-----	454	1,537	8	98	0	666
May 16-22-----	124	397	1	14	2	314
May 23-28-----	200	329	0	22	0	628
	:	:	:	:	:	:

Georgia. P. M. Gilmer (May 15): At Tifton in southern Georgia slight weevil damage is appearing in isolated spots. Apparently the overwintering brood is the smallest in many years.

Mississippi. C. Lyle (May 22): Examinations were made on 18 farms in 10 counties during the last week and weevils were found in only 1 field.

E. W. Dunnam (May 15-29) No weevils have been reported in Washington County.

Louisiana. R. C. Gaines and assistants (May 22): In Madison Parish the following record of boll weevils taken on nine flight screens is reported, in comparison with previous years.

Date	1937	1936	1935
	Number	Number	Number
May 1-----	5	0	7
May 8-----	5	1	6
May 15-----	6	1	35
May 22-----	6	1	10
	:	:	:

From present indications, weevils are more numerous in the vicinity of Tallulah than they were a year ago at this time but less numerous than during the last week in May of the 4 preceding years. Apparently there was a higher survival of weevils this spring than following any winter since 1932.

Texas. F. L. Thomas (May 15): The emergence of boll weevils at College Station has exceeded 6 percent and is already greater than the 11-year average. (May 22): Weevils are continuing to emerge from winter quarters and their numbers are increasing in the fields. As many as 455 per acre were found in one field in Dimmit County. (May 29): Weevils are reported in Nueces County and have been found to average 130 per acre in a few fields of Bexar County. The emergence totals more than 9 percent and has been exceeded only three times in 12 years.

R. W. Moreland (May 8-15): On 1,200 cotton plants in Brazos and Burleson Counties in 3 fields of unchopped cotton 11 weevils were found and on 800 plants in 3 fields where the cotton had been chopped 16 weevils were found.

K. P. Ewing (May 8): In Calhoun County indications are that there are not as many boll weevils this year as last, although numbers are higher than normal. (May 15): This week there was a considerable increase over last in the number of weevils found in cotton in the river bottom in Jackson County, which indicates that they are still coming out of hibernation. Examination of 5,600 cotton plants in 11 fields showed an average of 1.6 weevils per 100 plants, as compared to 0.3 per 100 found last week. In Calhoun County 5,700 plants in 28 cotton fields were inspected and an average of 0.18 weevil per 100 plants was found, as compared to the previous week (May 8) of 0.15 per 100 plants. (May 22): In the Lavaca River bottom, in Jackson County, in the examination of 2,200 plants in 5 fields the average number of boll weevils per 100 plants was 2.32 this week, as compared to 1.6 last week. All of this increase was in one field where the cotton had grown unusually large and there was a concentration of weevils in this field. The other 4 fields showed about the same infestation as during the previous week. In 1,700 cotton plants in 47 fields in Calhoun County the average boll weevil per 100 plants was 0.106, a reduction from an average of 0.18 per 100 plants the previous week. The decrease was probably due to the fact that more fields in the open prairie were inspected this week. (May 29): In the Lavaca River bottom, in Jackson County, 1,300 cotton squares were inspected in 4 fields; the boll weevil infestation averaged 38 percent punctured squares and there were 2.8 adult weevils per 100 squares. The maximum infestation was 50 percent and the minimum, 25 percent. In Calhoun County no boll weevils were found on 17,300 cotton plants examined for cotton flea hoppers, but this was not a true index of infestation, as the weevils have left the terminal buds and are now on the larger cotton squares.

Florida. H. C. Young, J. T. Roy, and K. H. Smith (May 1): No boll weevils have been found in cotton fields to date. Indications are that emergence will be light throughout the State. (May 15): In Alachua County weevil counts were made in 17 fields and only 9 were infested. The number of weevils ranged from 20 to 170 per 10,000 plants, the average for all fields being 35 per 10,000 plants. (May 22): In Alachua County 24 fields were inspected and weevils were found in 18. The number of weevils ranged from 10 to 275 per 10,000 plants in the infested area, or an average of 47 per 10,000 plants in all fields examined. (May 29): In Alachua

County 16 of the 21 fields examined were infested with weevils. The number of weevils in the infested fields ranged from 13 to 220 per 10,000 plants. The average population of all fields examined was 56 weevils per 10,000 plants.

COWPEA CURCULIO (Chalcodermus aeneus Boh.)

Georgia. T. L. Bissell (May 27): Adults are seriously damaging young cotton at Fort Valley in central Georgia, by feeding into the stalks and leaf petioles. About 20 percent of the plants in one field, where cowpeas were grown in corn last year, are killed.

PINK BOLLWORM (Pectinophora gossypiella Saund.)

Texas. A. J. Chapman (May 1): At Presidio there was a heavy emergence of moths from the hibernation experiments during the week, indicating a heavier survival than last year. (May 15): There has been a reduction in emergence from all the hibernation tests except the one irrigated on April 20. The emergence indicates a higher percentage of survival than last year.

COTTON LEAF WORM (Alabama argillacea Hbn.)

Texas. F. L. Thomas (May 27): The cotton leaf worm was reported from Mueces County today.

K. P. Ewing (May 8): In Calhoun County no leaf worms have been found. Last year the first one was found on May 5.

Correction.--The locality for the cotton leaf worm reported in the Insect Pest Survey Bulletin, June 1936 (vol. 16, p. 97), should have been Port Lavaca, Tex.; instead of Port Tobacco.

COTTON FLEA HOPPER (Psallus seriatus Reut.)

South Carolina. F. F. Bondy (May 15): One cotton flea hopper nymph found in Florence County.

Mississippi. A. L. Hammer (May 24): The cotton flea hopper is rather common on cotton at State College.

Louisiana. R. C. Gaines (May 15): In Madison Parish 94 adults and 11 nymphs were found in 300 sweeps on evening primrose. In 500 sweeps near Tendall 36 adults and 2 nymphs were taken. No sweepings were made during the same week last year but the number found this week was greater than that found during the last week of May in 1936.

Texas. F. L. Thomas (May 8): Flea hoppers are more abundant in central Texas than in the more northern counties. (May 29): Control measures have been started in some counties of southern Texas. There are but few fields in the central part where control measures would be justified.

K. P. Ewing (May 8): At Port Lavaca, in Calhoun County, there was a decided increase in the number of flea hoppers found on the screens and also in the cotton fields this week, as compared to last week. (May 15) There was a decrease this week over last in the number of flea hoppers found on the screens and also in the cotton fields. There was also a decrease in the population on horsemint and evening primrose.

COTTON APHIDS (Aphididae)

Georgia. P. M. Gilmer (May 15): In southern Georgia a few aphids were found. Most of these have been parasitized.

Florida. H. C. Young (May 1): At Alachua a few aphids were noted in some fields.

South Carolina. F. F. Bondy (May 15-29): In Florence County some fields show a considerable infestation of leaf aphids.

F. F. Bondy and C. F. Rainwater (May 22): Root aphids are killing young cotton and causing serious damage in some fields.

W. C. Nettles (May 21): Cotton root aphids were first noticed in the coastal section during the first half of May. Considerable damage occurred in some fields.

Texas. K. P. Ewing (May 8): In Calhoun County cotton aphids were found to be numerous in practically all fields but apparently doing no damage. Predators seemed to be increasing. (May 15): Predators very numerous and giving control; aphids considerably decreased in numbers.

THRIPS (Thysanoptera)

South Carolina. J. G. Watts (May 24): Frankliniella fusca Hinds was becoming abundant on cotton at Florence by May 20.

F. F. Bondy and C. F. Rainwater (May 29): Thrips have done great deal of damage to cotton in Florence County.

Mississippi. E. W. Dunnam (May 20): In Washington County an average of 2.24 thrips per cotton plant were found when the plants were in the four- and five-leaf stage. Practically all of the thrips were nymphs. Damage is more severe in the older cotton and some buds are blasted, but vegetative branches have not appeared. (May 29): The average seedling infestation of thrips ranges from 2.15 to 14.00 per plant. The lighter infestations are found in small unchopped cotton and the heavier ones in block-chopped cotton. Leaf damage is noticeable in most fields, but side branching has not started.

Louisiana. C. O. Eddy (May 24): F. fusca was abundant on seedling cotton throughout the State during the first two-thirds of May. Much injury resulted.

R. C. Gaines (May 15): At the Tallulah laboratory thrips are reported to be appearing on cotton. Counts made in the latin-square tests showed an average of slightly more than one thrips per plant.

Texas. F. L. Thomas (May 22): In some fields in central Texas 100 percent of the plants are infested. (May 29): Injury to cotton has attracted much attention and is reported as severe in DeWitt, Grimes, Furlson, Brazos, and Madison Counties.

F O R E S T A N D S H A D E - T R E E I N S E C T S

PERIODICAL CICADA (Magicicada septendecim tredecim Walsh & Riley)

- Indiana. L. F. Steiner (May 26): In certain orchards which suffered a heavy attack 13 years ago newly made exit tunnels are extremely abundant. In one Vincennes orchard adjoining a wooded area many of the trees have more than 10,000 exit tunnels under them. Emergence began about May 25.
- Kentucky. W. A. Price (May 20): The first report of the periodical cicada was received from Mayfield, in western Kentucky.
- Tennessee. G. M. Bentley (May 28): The periodical cicada has made its appearance at Overton Park at Memphis, Shelby County. It was first observed on May 23, but apparently the forms made their first appearance in this park on May 19. It also appeared in Tipton and Lauderdale Counties.
- Mississippi. C. Lyle (May 24): Reports throughout northern Mississippi indicate that Brood XXIII of this insect is now appearing in large numbers. Specimens were received from Grenada on May 17, including some of the variety cassinii Fisher. On May 22 they were reported from all over Tippah County and on the same date were very abundant in Pontotoc, Chickasaw, and Alcorn Counties. G. L. Bond reports hearing them recently in George, Greene, Wayne, and Jackson Counties.
- Missouri. W. F. Turner (May 28): In Gardner National Forest, in the northwestern corner of Howell County on oaks; also in Gardner National Forest in the northeastern corner of Douglas County (distinct from colony reported in Howell County; separated by several miles). This colony was heard along the highway for over a mile.

CANKERWORMS ET AL (Geometridae)

- Rhode Island. A. E. Stene (May 27): Cankerworms are abundant, largely in Providence County.
- Connecticut. P. Garman (May 19): Alsophila pometaria Harr.. much less abundant on apple than last year, in New Haven County.
- New York. R. D. Glasgow (May 22): The fall cankerworm is defoliating shade trees at Loudonville and is apparently more abundant elsewhere in the Hudson Valley than last year.
- E. P. Felt (May 24): Eggs of Ennomos subsignarius Hbn. were received from Newburgh, indicating a probable local abundance. This is occasionally extremely numerous and injurious in the Catskill forests.
- Ohio. T. H. Parks (May 24): Two or three species of spanworms were found

on a trip made May 14, recently hatched and devouring leaves of oak, hickory, and elm in farm wood lots of western Ohio. Many of these trees near Dayton probably will be defoliated, as the outbreak seems to be more intense than that of a year ago. The spring cankerworm (Paleacrita vernata Peck.) is injuring apple trees in unsprayed home orchards in the western third of Ohio and is very abundant on many elms in forest and dooryard plantings.

Missouri. L. Haseman (May 26): One of the heaviest outbreaks of cankerworms I have seen in many years is showing up throughout central and northeastern Missouri. The larvae are about half-grown at this time and are stripping some large elm trees in the Clarksville district. At Columbia they are very abundant but not yet seriously stripping trees.

Kansas. H. R. Bryson (May 25): Very little injury has been caused by cankerworms this year. Two or three areas around Manhattan have experienced some injury.

Oklahoma. F. A. Fenton (May 24): Cankerworm injury was reported from Okmulgee

FOREST TENT CATERPILLAR (Malacosoma disstria Hbn.)

Vermont. J. V. Schaffner (May 24): Hatching of the forest tent caterpillars in Bennington County was general on May 3. The majority of the caterpillars were in the third instar on May 22 and the effect of this group feeding was becoming noticeable, particularly on sugar maple.

New York. R. D. Glasgow (May 22): The forest tent caterpillar, abundant again in parts of eastern New York, is reported to have defoliated some pin oak at Chatham.

South Carolina. F. Sherman (May 24): Forest caterpillar locally abundant in Dorchester and Berkeley Counties, in the eastern section.

W. C. Nettles (May 21): The forest tent caterpillar was causing serious forest tree defoliation about May 1 in the lower part of the State.

Minnesota. J. E. Grathwol (May 11): Hatching of forest tent caterpillar started about May 11. Very abundant.

GYPSY MOTH (Porthetria dispar L.)

Maine. F. H. Lathrop (May 19): Larvae were observed hatching from egg clusters in the experimental orchard at Monmouth, Kennebec County, on May 4. Hatching proceeded very slowly during the next 10 days. On May 16 large numbers of newly hatched larvae were observed on the experimental trees, but little or no feeding had taken place. The insect is unusually abundant this spring. In southern Maine it threatens to do considerable damage in apple orchards located near infested woodland.

WHITE-MARKED TUSSOCK MOTH (Hemerocampa leucostigma S. & A.)

Ohio. E. W. Mendenhall (April 28): The white-marked tussock moth nests (cocoons) are abundant on shade trees in parks in Caldwell, Noble County.

BIRCH

BIRCH LEAF MINER (Fenusa pumila Klug)

Connecticut. R. B. Friend (May 21): Adults are very abundant on gray birch and have been ovipositing for about a week.

New York. W. E. Blauvelt (May 24): Adults seen on Betula populifolia in various localities in Westchester, Nassau, and Suffolk Counties from May 10 to 14. Egg laying was well under way by the latter date.

ELM

ELM LEAF MINER (Kaliosysphinga ulmi Sund.)

New York. W. E. Blauvelt (May 24): Adults were first observed on May 18 and were abundant on May 23 on English elm at Ithaca. Many eggs had been deposited but none had hatched by May 23.

ELM LEAF BEETLE (Galerucella xanthomelaena Schr.)

Massachusetts. J. V. Schaffner (May 24): P. A. Berry reports that the elm leaf beetles were issuing from hibernation in large numbers at Woburn the week beginning May 17.

New York. R. D. Glasgow (May 22): The elm leaf beetle, apparently less abundant in the Hudson Valley since 1934 than during the preceding 3 years, appears to have come through the mild winter in greatly increased numbers. It is already causing notable injury at Catskill and numerous correspondents earlier this spring reported the invasion of houses by hordes of the beetles coming out of hibernation.

California. C. S. Morley (May 6): Spraying for elm leaf beetle in Bakersfield was started the first of this month. The first pests were found feeding on April 28.

APHIDS (Aphidae)

Delaware. L. A. Stearns (May 5): Infestation beginning at Newark.

North Dakota. J. A. Munro (May): Aphids are very abundant on elms at Fargo.

EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

Ohio. E. W. Mendenhall (May 20): Very abundant on elm trees in central Ohio.

Indiana. J. J. Davis (May 27): Reported abundant at South Bend.

HEMLOCK

HEMLOCK SCALE (Aspidiotus abietis Schr.)

Connecticut. E. P. Felt (May 22): So extremely abundant on a small hemlock at Greenwich that it produced badly yellowed foliage and evidences of serious injury.

LARCH

LARCH CASEBEATER (Coleophora laricella Hbn.)

Connecticut. W. E. Britton (May 21): One twig from Hamden brought to the office. Leaves with distal half mined. Pupae present.

Vermont. H. L. Bailey (May 25): Very abundant at Dorset, Bennington County, southwestern Vermont, and Montpelier, Washington County, central Vermont.

New York. R. D. Glasgow (May 22): At North Elba on May 12 had nearly all left their hibernation stations and migrated to the newly opening buds. Very rarely had more than one needle in a cluster been mined. This introduced insect is slowly destroying the tamarack in northern New York forests. Large numbers of trees have already died as a result of repeated defoliation and very few trees do not show serious injury.

R. E. Horsey (May 1 and 11): Very numerous this year on American, Siberian, European, Japanese, and other larches at Rochester; none immune. First noted on May 1 and still feeding on May 11.

MAPLE

MAPLE BORER (Synanthedon acerni Clem.)

Ohio. E. W. Mendenhall (May 5): Troublesome in both hard and soft maples in plantings in parks and streets.

COTTONY MAPLE SCALE (Pulvinaria vitis L.)

Alabama. J. M. Robinson (May 26): Active on leaves of maples in Birmingham on May 14.

MAPLE BLADDER GALL (Phyllocoptes quadripes Shim.)

Connecticut. E. P. Felt (May 22): Developing in considerable numbers on unsprayed soft maple trees at North Stamford, although those treated with a dormant spray are practically unaffected.

MESQUITE

A MIRID (Melanotrichus minus Knight (?))

Arizona. T. P. Cassidy (May 6): We have had several complaints recently from cattle people about the foliage on mesquite dying and drying up as though the tree had blight. The people are very much concerned, as they depend largely on the mesquite foliage for feed until the summer rains occur. At Sawyer Ranch a similar situation was reported. The blighted trees were spotted through the mesquite breaks and were very heavily infested with hoppers; found hoppers on all of the mesquite trees swept, even though they did not show signs of blight, but they were not as numerous on the nonblighted trees. (Det. by E. G. Barber.)

AN UNDERWING (Catocalina)

Arizona. C. D. Lebert (May 21): Larvae (species undetermined) were found by the thousands under the bark of some large mesquite trees in a Phoenix yard. The larvae come out at night, drop from the trees, cover the lawn below, and crawl into the home, where they annoy the occupants. When disturbed, many of the larvae suspend themselves by a silken thread from the trees.

CAK

CAK GALL (Andricus coronus Beut.)

New York. W. E. Blauvelt (May 24): A heavy infestation was noted on a few specimens of pin oak at Rye, Westchester County, on May 10. Most of the galls had already fallen to the ground.

PINE

EUROPEAN PINE SHOOT MOTH (Rhyacionia buoliana Schiff.)

New Jersey. J. V. Schaffner (May 22): Recent observations in the northern and central parts of New Jersey show that the European pine shoot moth is generally distributed throughout this area. In several localities it is apparent that the infestations are on the increase.

New York. W. E. Blauvelt (May 24): Light-to-heavy infestations in red, lugho, and Austrian pines were observed from May 10 to 15 in various localities throughout Westchester, Nassau, and Suffolk Counties. Numerous larvae were collected but no pupae were found.

A SAWFLY (Neodirron spp.)

Massachusetts. J. V. Schaffner (May 24): The sawfly reported in 1935 and 1936 as seriously injuring red pine in plantations in Middlesex County continues in outbreak form. Hatching was general on May 7 and on at least two plantations the infestation was so heavy that spraying was necessary to prevent serious defoliation.

AN APHID (Cinara sp.)

Virginia. W. J. Schoene (May 24): During the first week in May flights of aphids were observed at several points in the State, especially at Charlottesville, Staunton, and Blacksburg, the insects being so numerous in some localities as to interfere with building operations. We have not definitely determined the insect, but it appears to be Cinara sp.

EASTERN PINE BARK BEETLE (Ips pini Say)

Michigan. E. L. McDaniel (June 2): Specimens of this beetle were collected on a Norway pine plantation near Pontiac, Oakland County. A number of young trees growing on a high, sandy knoll had been attacked and several killed. (Det. by M. W. Blackman.)

SPRUCE

SPRUCE GALL APHID (Charmes abietis L.)

Wisconsin. E. L. Chambers (May 25): A number of requests have been received this spring for identification and control.

New York. W. E. Blauvelt (May 24): Numerous specimens of Norway spruce infested with old galls and overwintered nymphs were received from various localities. The overwintered females began laying eggs at Ithaca on May 8, when buds were just beginning to show green on the more vigorous trees. Many eggs had been laid by May 11 on Long Island, but no hatching had been observed by May 14. Picea canadensis was found to be rather heavily infested at Jamesport on May 13.

A EUCOSMID (Argyroploce abietana Fern.)

New York. W. E. Blauvelt (May 24): Badly infested specimens of blue spruce were received from Ononta on May 10 and from Bombay on May 18. When examined on May 18 most of the individuals were in the pupal stage. Adults started to emerge from this material on May 20. (Identified by W. T. M. Forbes.)

A SCALE (Fiorinia sp.)

New York. E. P. Felt (May 22): A spruce scale, Fiorinia sp., was found in considerable numbers on a spruce at Glen Cove, Long Island.

WILLOW

A FLEA BEETLE (Altica prasina Lec.)

Washington. M. J. Forsell (May 12): Attacking native willows in King County. The pest is not new in the area. Skeletonizing the leaves so severely in places that small branches are killed.

INSECTS AFFECTING GREENHOUSE
AND ORNAMENTAL PLANTS

CITRUS WHITEFLY (Dialeurodes citri Ashm.)

Maryland. E. N. Cory (May 17): A nursery at Pittsville infested through a shipment from South Carolina. Nurserymen are now working to clean up the infestation.

A SCARABAEID (Plectris aliena Chapin)

South Carolina. Charleston News and Courier (May 28): The Charleston beetle (P. aliena) put in its appearance on several lawns in Charleston this week after an absence of a year or two.

ARBORVITAE

ARBORVITAE LEAF MINER (Argyresthia thuiella Pack.)

Connecticut. E. P. Felt (May 22): Arborvitae leaf miner is locally abundant here and there, considerable amount of injury being found at Westport.

AZALEA

AZALEA SCALE (Eriococcus azaleae Comst.)

Louisiana. H. L. Dozier (May 12): Heavy infestation located on azaleas in commercial nursery at Lafayette. On this date newly hatched crawlers were very abundant and bushes were blackened from sooty mold.

A SCALE (Pseudaonidia paeoniae Ckll.)

Louisiana. H. L. Dozier (May 17): Generally distributed over southwestern Louisiana on azalea and camellia, often causing serious damage.

BOXWOOD

BOXWOOD LEAF MINER (Monarthropalpus buxi Laboulb.)

New York. W. E. Blauvelt (May 24): Light-to-very-heavy infestations in boxwood were observed in various localities in Westchester, Nassau, Suffolk, and Rockland Counties from May 10 to 15. All miners were in pupal stage. Apparently no adults had emerged by May 15 and only a small percentage of the pupae showed any darkening of the appendages preparatory to emergence.

CAMELLIA

CAMELLIA SCALE (Lepidosaphes camelliae Hoke)

South Carolina. W. C. Nettles (May 21): Present on practically every camellia in South Carolina.

CHRYSANTHEMUM

CHRYSANTHEMUM GALL MIDGE (Diarthronomyia hypogaea Loew.)

Wisconsin. E. L. Chambers (May 25): Serious injury to chrysanthemums observed in several greenhouses at various points in the State.

GLADIOLUS

GLADIOLUS THRIPS (Taeniothrips simplex Morison)

Florida. J. R. Watson (May 22): The gladiolus thrips is very abundant in Matee County. The season is about over and the bulbs are being rapidly damaged.

BULB MITES (Phizoglyphus hyacinthi Edw.)

Ohio. E. W. Mendenhall (May 20): Bulb mites were injurious in gladiolus bulbs in a nursery at Springfield.

HOLLY

HOLLY LEAF MINER (Phytomyza ilicicola Loew)

Connecticut. E. P. Felt (May 22): Holly leaf miner occurs here and there locally. A rather serious infestation was found at Greenwich.

New York. W. E. Blauvelt (May 24): Heavy infestations in Ilex opaca were observed at White Plains, Westchester County, on May 10, and at several places on Long Island on May 11 to 14. All the larvae had pupated but no adults had emerged. Adults started to emerge on May 18 and considerable numbers had emerged by May 23.

JUNIPER

A LEAF MINER (Argyresthia alternatella Kearf.)

New York. W. E. Blauvelt (May 24): Severe injury to a fair-sized planting of juniper was observed on Long Island on May 15. Over 90 percent of the insects were in the pupal stage, in gray silken cocoons attached to the leaves and bark. Adults began to emerge on May 19 and were identified by W. T. M. Forbes. Specimens were also received from Patchogue, from which adults began to emerge on May 20.

JUNIPER WEBWORM (Dichomeris marginellus F.)

New York. W. E. Blauvelt (May 24): Moderate-to-heavy infestations and injury on juniper in Westchester County and Long Island from May 9 to 15. Most of the larvae were nearly full grown but no pupae could be found.

LILAC

LILAC BORER (Podosesia syringae Harr.)

Wisconsin. C. L. Fluke (May 20): This insect found doing considerable damage to lilacs in Brown County.

MUGHO PINE

PINE LEAF MINER (Paralechia pinifoliella Chamb.)

Connecticut. E. P. Felt (May 22): The pine leaf miner was found in abundance on mugho pine at Westport.

ROSE

ROSE LEAF BEETLE (Nodonota puncticollis Say)

Maryland. J. A. Hyslop (May 26): Seriously affecting the blossoms of roses and peonies, but apparently not as numerous as last year. Many flowers are damaged but many are also free from injury.

MODULAR TWIG GALL (Rhodites nodulosus Beut.)

Nebraska. M. H. Swenk (May 20): A rose twig that had galls on it formed by R. nebulosus was sent in from Hitchcock County on May 20.

A ROSE APHID (Myzaphis rosarum Kltb.)

Ohio. E. W. Mendenhall (May 20): Rose aphids are quite numerous on rose bushes in gardens of private homes in central Ohio.

FLOWER THRIPS (Frankliniella tritici Fitch)

Mississippi. C. Lyle (May 24): Specimens of roses infested with thrips were received from Philadelphia, Magnolia, Millard, Lexie, and Starkville during the first half of the month.

SNOWBALL

BEAN APHID (Arabis runcicis L.)

Utah. G. F. Knowlton (May 18): A. runcicis is extremely abundant and damaging snowball bushes at Smithfield and is found on occasional bushes at Logan.

YEW

BLACK VINE WEEVIL (Brachyrhinus sulcatus F.)

Rhode Island. A. E. Stone (May 27): A severe infestation of black vine weevil on Taxus at Cranston.

New York. W. E. Blauvelt (May 24): Light-to-heavy infestations were found on Taxus cuspidata in several localities on Long Island during the week beginning May 9. These and past observations indicate that the pest is present in at least a considerable percentage of nursery and ornamental plantings on Long Island and in Westchester County, and that it frequently causes serious damage where it is not controlled.

YUCCA

A MIRID (Halticotoma valida Reut.)

Maryland. C. A. Weigel (May 8): Observed the leaves of yucca at College Park teeming with apparently newly hatched nymphs. Foliage showed characteristic stippling. The mirids quickly run for the other side of foliage when disturbed.

INSECTS ATTACKING MAN AND
DOMESTIC ANIMALS

MAN

MOSQUITOES (*Culicinae*)

United States. G. H. Bradley (May): The first adults of Aedes sollicitans Walk. were observed near Milford, Del., on May 10 and at Girdletree, Md., on May 3. A. cantator Coq. was observed several days prior to May 3. Salt-marsh mosquitoes had not been troublesome in the coastal towns up to May 24.

B. V. Travis (May 20): Mosquitoes have been more annoying to man in the vicinity of Newton, Ga., and Tallahassee, Fla., than in many years, according to the natives. During the last 2 weeks it has been hot and dry and the mosquito population has decreased greatly.

Florida. F. C. Bishopp (May 20): A correspondent at Minneola writes, "We are being eaten alive by mosquitoes. The insects are so numerous that they sound like a swarm of bees surrounding the house." A correspondent at Miami writes, "So far this season we have had very few salt-marsh mosquitoes (A. sollicitans and A. taeniorhynchus Wied.), although conditions have been favorable several times for flights from the areas south of our ditched sections.

Illinois. F. C. Bishopp (May 25): A correspondent at East Saint Louis reported that mosquitoes were so abundant that one could hardly get out of doors.

SAND FLIES (*Culicoides* spp.)

New Jersey. G. H. Bradley (May 8): These insects were abundant and annoying to man on the salt marshes near Atlantic City.

Delaware. G. H. Bradley (May 21): Sand flies or punkies were somewhat annoying to men working on the salt marshes near Fenimore Landing.

Mississippi. K. L. Cockerham (May 8): Sand flies at Biloxi have been an unusual nuisance throughout the entire month of April.

AMERICAN DOG TICK (*Dermacentor variabilis* Say)

New York. F. C. Bishopp (May 25): Murray Maxwell reports from Roslyn, Long Island, that this tick appeared about April 15 on the west end of the island, whereas on the east end it had not yet appeared on May 7. The writer states: "I feel that this year it may be close to an epidemic. There are many more than ever before and they appeared earlier."

Maryland. F. C. Bishopp (May 24): Reports from parts of Maryland adjacent to the District of Columbia indicate that wood ticks have been very numerous this month. The number of cases of spotted fever reported unofficially to the State Public Health Service appears to be about the same as last year.

Illinois. C. L. Metcalf (May 25): The wood tick appears to be unusually abundant in Illinois this spring.

Iowa. F. C. Bishop (May 6): The first appearance this spring of this tick was on May 6, according to G. S. Cantonwine, who says that a careful check of dogs, cattle, and people made periodically throughout the spring in this area where ticks are abundant showed no ticks to be present prior to this date.

BLACK WIDOW SPIDER (Latrodectes mactans F.)

Alabama. J. M. Robinson (May 26): The black widow spider was reported causing concern at Falkville on May 12.

Nebraska. M. H. Swenk (May 2): Reports were received from Antelope and Kearney Counties on May 2 and 9, respectively.

Colorado. G. M. List (May 22): A black widow spider was taken in the College gymnasium early in May at Fort Collins.

Utah. G. F. Knowlton (May 20): Several inquiries concerning black widow spider have been received lately.

SCREWORM (Cochliomyia americana C. & P.)

United States. W. E. Dove (May 31): The low point for cases occurred during the last week of December as compared to the third week of February of the preceding year. Localized outbreaks occurring in the line of advance in Jefferson County, Fla., and Camden County, Ga., were brought under control. At Hinesville, Ga., the first case of the season occurred on May 25, which was 25 days later than the first case last year, and 40 days later than the first case of 1935. For the 4-week period ended May 21, there were 2,575 cases representing about one-half million animals in Florida. In Georgia 60 cases were reported in the southern counties. As yet, cases have not been found in western Florida, South Carolina, Alabama, Mississippi, Louisiana, or in eastern Texas. In California no screwworms were present in the Imperial Valley during the winter and most of the animals are now in the higher elevations without infestations. Screwworms are now present in small numbers in these sections, in three counties of the southeastern corner of New Mexico, and a few cases are occurring in Pima and Cochise Counties, Ariz. Throughout this area there is a low incidence of cases. Much of the shearing was completed in advance of the spread of screwworms and most of the shear cuts were treated with pine tar oil. For the 4-week period ended May 21 there were 7,424 cases reported from Texas, representing more than three million animals of the infested area. The heavy shipments of feeder stock to Oklahoma and Kansas are about completed and stockmen made efforts to ship only "clean" animals into these areas.

Texas. W. C. Maxwell (May 5): Several cases in Andrews County, a few cases in Martin County, and two severe cases in Glasscock County. Most of these cases started the latter part of April.

D. C. Parman (May): As a result of a survey from April 16 to May 4, the presence of C. americana was established in southwestern Texas extending as far west as Reeves and Presidio Counties, as far north as Brown and Runnels Counties, and as far east as Burleson and Austin Counties.

Arizona. D. C. Parman (May 12): The first adult taken in Arizona this year was captured at Pozo Blanco, Maricopa County, on May 12.

HORN FLY (Haematobia irritans L.)

Louisiana. C. L. Stracener (May): Horn flies are abundant on cattle.

Missouri. L. Haseman (May 26): Horn fly has already appeared in annoying numbers on cattle in central Missouri.

GULF COAST TICK (Amblyomma maculatum Koch)

Florida. A. L. Brody (May 25): Only 1 male of this tick was found on 38 heads of cattle examined in connection with certain burning experiments at Penney Farms, Clay County. This is the first adult observed on livestock in that area this spring. No immature stages of the tick were found on eight birds of several different species examined on April 13 and 14.

Mississippi. G. L. Bond (May 24): This tick is reported very abundant in the counties of George, Greene, and Wayne.

Texas. W. E. Dove (May 8): W. J. Spicer collected specimens at Laward, in Jackson County, on May 6.

SHEEP

SHEEP BOTFLY (Oestrus ovis L.)

Georgia. E. R. McGovran (May 7): On May 7, an adult was taken at Valdosta, this being the first specimen taken this year; however, I believe the flies have been active in the field for at least 2 weeks, as the sheep in our pastures have acted as though they were being annoyed by nose botflies.

HOUSEHOLD AND STORED-PRODUCTS INSECTS

TERMITES (Reticulitermes spp.)

- New York. R. D. Glasgow (May 22): R. flavipes was found in Loudonville causing serious damage to the woodwork of a residence property.
- Indiana. J. J. Davis (May 27): Termites are the subject of many inquiries, as usual at this season.
- Illinois. W. P. Flint (May 24): Termites are swarming generally in the southern part of Illinois.
- Nebraska. M. H. Swenk (May): A Hall County correspondent reported on May 19 that her house was heavily infested with termites. On May 14 from Ctoe County came injured wood and specimens of R. flavipes Kol.
- Colorado. R. G. Richmond (May 26): Considerable damage being done by the black-legged termite (R. tibialis Banks) in the baseboards and sills of a house at Denver. (Det. by T. E. Snyder.)
- Texas. F. L. Thomas (May): Termites reported May 6 and 8 from Rochester, in Haskell County, and from Texarkana, in northeastern Texas. Reports of injury are seldom received from as far northwest as Haskell County.
- Washington. E. J. Newcomer (March and April): More inquiries have been received regarding R. hesperus Banks from Yakima Valley than ever before.

RAISIN MOTH (Ephestia figulilella Greg.)

- California. H. C. Donohoe (May 8): The first adult, out of doors, was noted on May 4 at an open raisin storage in Fresno County, San Joaquin Valley. As in previous years, the first moths appeared at about the same date as the first ripe, fallen mulberries were observed. At this period mulberries are the only known field food.

TOBACCO MOTH (Ephestia elutella Hbn.)

- California. H. G. Donohoe (May 8): Two larvae from stored raisins at Fresno, San Joaquin Valley, were reared and identified as E. elutella. Although adults are common about raisin storages each spring, these are the first larvae that have been collected from raisins and definitely identified.

CIGARETTE BEETLE (Lasioderma serricorne F.)

North Carolina. W. D. Reed (May 5): In 25 suction light traps operating in warehouse of flue-cured cigarette tobaccos at Durham for the week ending April 30, a total of 12 cigarette beetles was caught. In 10 traps operating for the same period in warehouses of imported cigarette tobaccos, a total of 7 beetles was caught. This marks the first emergence of the spring brood in 1937.

HOUSE CENTIPEDE (Scutigera forceps Raf.)

Iowa. C. J. Drake (May 19): Specimens of the house centipede have been received from Bremer, Kossuth, Story, Linn, and Clayton Counties.

PEA WEEVIL (Bruchus pisorum L.)

Idaho. C. Wakeland (May 25): A very slight infestation of the pea weevil was observed in pea fields in the early blossom stage in Payette County on May 18. The heaviest population encountered was 4 adults in 150 sweeps of a 15-inch net. In adjacent, unblossomed fields no weevils were captured by sweeping.

BLACK CARPENTER ANT (Camponotus herculeanus pennsylvanicus Deg.)

New Jersey. J. C. Silver (June 3): Sills and porch supports have been severely damaged in several localities in northeastern New Jersey by an ant, probably this species.

Wisconsin. E. L. Chambers (May 25): Several complaints have been received of injury from the carpenter ant to woodwork.

THE MORE IMPORTANT RECORDS FOR JUNE

The grasshopper situation has developed to serious proportions in Colorado, Montana, Nebraska, Kansas, Iowa, Wyoming, the Dakotas, Missouri, Oklahoma, Texas, Arkansas, Illinois, with less general outbreaks in New Mexico, Arizona, California, Minnesota, Wisconsin, Utah, and Michigan.

Along the Atlantic seaboard, from Maine to Georgia, localized wireworm injury to potatoes, tobacco, and garden vegetables has been reported. On some farms in the shade-grown tobacco section of Connecticut, loss of newly set plants ran as high as 50 percent. Unusually severe damage to tobacco was also reported from North Carolina. Limited serious infestations by wireworms were reported from the East Central States and from Kansas, Idaho, and Oregon.

White grubs were very numerous and destructive in the East Central States, from Ohio and Michigan to Kansas.

Rose chafer damaged a wide variety of crops, occurring in outbreak proportions in New England and the Middle Atlantic States, westward to Michigan.

In North Dakota the pale western cutworm has developed to such proportions in the western part of the State that as high as 75 percent of the seeded crops have been destroyed.

Localized outbreaks of the beet webworm are reported from North Dakota and Utah, with an outbreak of the garden webworm in the eastern half of Kansas.

The chinch bug, in general, is not seriously abundant.

Localized and serious outbreaks of armyworms occurred in Delaware, Maryland, and Virginia, during the early part of the month.

Two counties in North Carolina--Edgecombe and Halifax--have been added to the territory known to be infested by the vetch bruchid.

Peak flights of the codling moth occurred during the last week in May and the first week in June in the Hudson River Valley, N. Y., the infestation in this area being much heavier than last year. Moths of the first generation began emerging in Georgia during the second week in June. The spring-brood flight in Yakima Valley, Wash., reached its peak during the last week in May, which is about 10 days later than in 1936.

The eastern tent caterpillar continued to be a serious pest in the New England and Middle Atlantic States.

Emergence of first-brood plum curculio from the ground was late this year. Practically all of the earliest varieties of peaches have been harvested in the peach-growing sections of Georgia and were remarkably free from damage. This insect is reported as being more abundant than usual in Mississippi and Texas.

Blister beetle injury was reported from the South Atlantic States and westward around the Gulf to Oklahoma and Kansas.

Flea beetle damage to potatoes and garden vegetables was somewhat severe over the New England States and New York and westward to North Dakota.

The seed-corn maggot has seriously damaged shade-grown tobacco in the Connecticut River Valley, and a variety of field and garden crops from New York through Michigan and Indiana, to North Dakota. Damage was also reported from Colorado.

An outbreak of the green stinkbug occurred about the middle of the month in Alabama and Mississippi, the insects seriously damaging cotton, peas, beans, and miscellaneous truck crops. In Mississippi, the outbreak is said to be the most severe ever recorded.

Injury by the vegetable weevil necessitated 90-percent replanting in tomato fields in San Bernardino County, Calif.

The Mexican bean beetle is more abundant than it has been during the last 2 years in the New England States. The insect is generally prevalent throughout the Middle Atlantic States and the lower Mississippi Valley.

Heavy infestations of the pea aphid were reported from western New York and Long Island. This pest is also sufficiently numerous in northern Utah to require control measures.

Squash bugs appear to be somewhat more troublesome than usual in New England, Middle Atlantic, and South Atlantic States. Damage was also reported from Mississippi and Kansas.

Very heavy outbreaks of the asparagus beetle were reported from Massachusetts and New York.

A heavy outbreak of tobacco flea beetles occurred in the Piedmont section of Virginia and North Carolina, southward to Florida, and westward to Tennessee.

The cotton flea hopper is generally reported from the Cotton Belt. In parts of Texas this insect is attracting more attention than the boll weevil.

The cotton leaf worm appeared about 2 weeks later than last year in southern Texas. The first worms were found in Nueces County on May 27, in Calhoun County on June 9, and in Jim Wells County on June 19.

Thrips injury to cotton has been reported generally from South Carolina to Texas.

The forest tent caterpillar caused considerable complete defoliation of forest trees in the New England and Middle Atlantic States, and westward to northeastern Minnesota.

Eggs of the gypsy moth started hatching in Maine and New Hampshire early in May. This insect is causing extensive and serious defoliation in many parts of Massachusetts.

The larch case bearer was severely injuring larch in New England and eastern New York.

The anobiid beetle Platybregmus canadensis Fisher was reported to be damaging flooring for the first time in the United States. It was originally described from Ontario, Canada, in 1934.

THE MORE IMPORTANT ENTOMOLOGICAL FEATURES IN CANADA

Hatching of the lesser migratory grasshopper was first noted in Manitoba on May 10. Hatching of the eggs of this species and of the two-striped grasshopper was generally slow and irregular. Heavy rains early in June retarded grasshopper development. No crop damage and no need for control measures had developed by mid-June, but toward the end of the month the insects were causing some alarm in southwestern Manitoba, and damage is expected if dry weather sets in. In Saskatchewan the lesser migratory grasshopper began hatching in the Estevan district on May 8. Egg mortality of this species was generally low. The first nymphs of the clear-winged grasshopper were observed on May 10, near Unity, Saskatchewan, and hatching was in full swing in northwestern districts by the end of May and was proceeding in stubble generally, although more irregularly. Fully half the eggs in all infested areas had hatched by June 1. In western Saskatchewan an egg mortality of 60 percent of this species was observed. Possibly a fungous organism was involved. By the third week of June grasshopper hatching throughout the Province was practically complete. Development was very irregular but more advanced in northern sections where adults were beginning to appear. Up to mid-June, cool weather had restricted losses, and control efforts were considered adequate where crop prospects were good. In Alberta hatching of the lesser migratory grasshopper began late in April in light sandy soil areas in the Red Deer Valley. Owing to uneven egg development, the hatching period extended over several weeks. It was about 40 percent complete in east-central Alberta by May 31. Some crop losses had occurred early in June, but these were checked by control measures, and to some extent by rains. Late in June grasshoppers were becoming more active, with hot weather, but damage was still light. In southern British Columbia, in the Midway district, the clear-winged grasshopper was hatching the last week of May and a very heavy infestation has developed. The grasshopper situation is expected to be acute in the Province this season, although the insects were late in hatching.

Reports of serious cutworm damage have been largely confined to the Provinces of Alberta and Saskatchewan. The pale western cutworm was causing injury to fall wheat and rye at Lethbridge, Alberta early in April, the earliest re-

corded from that section. Towards the end of June, damage was over for the season, with the most extensive crop losses in the Province in a decade. Heavy damage was also done locally in Saskatchewan. Another species, the army cutworm, was more abundant in southern Alberta than at any time since 1928 on vegetation of all kinds, but losses were generally light. Many of the larvae were destroyed by disease. Hatching of eggs of the redbacked cutworm, at Saskatoon, Saskatchewan, was complete by April 19, or about 12 days earlier than 1936. Cutworms caused material loss in various localities in this Province.

Wireworms have been generally destructive in western Saskatchewan, especially in areas where crop growth was retarded by drought, soil drifting, and frost. In Alberta, approximately 1 percent of the wheat acreage is reported to have been destroyed. A recent survey in Manitoba indicated very little damage by these insects. Throughout southwestern Ontario wireworms were reported to be more numerous than usual.

Major flights of June beetles occurred in southern Quebec late in May and locally in southern Ontario. Third-year white grubs of this species are common in many parts of Ontario, where severe damage was done in 1936.

Asparagus beetles were unusually abundant in southern Ontario. In Niagara district the greatest injury to the asparagus crop occurred late in May.

Much damage to young vegetable garden plants was done by the hop flea beetle in southern Alberta.

An extensive acreage of planted seed beans was destroyed by the seed corn maggot in southern Ontario.

Winter mortality of codling moth larvae appears to have been light in southern Ontario and the Okanagan Valley, British Columbia.

Aphids are scarce in apple orchards of the Annapolis Valley, Nova Scotia. The apple aphid, green peach aphid, and black cherry aphid are present in injurious numbers in the Okanagan Valley, British Columbia.

The pear thrips has been found causing damage in orchards at Courtenay, Vancouver Island, and at Kelowna, British Columbia, both new areas for this species.

The fruit tree leaf roller is increasing in many sections of the Okanagan Valley, British Columbia, necessitating the application of oil sprays early in the spring.

Spruce mites have developed in outbreak proportions throughout the Prairie Provinces.

Outbreaks of tent caterpillars occurred in many parts of Eastern Canada, and were particularly severe in sections of Ontario and Quebec.

Infestations of the fall canker worm were reported in New Brunswick, southern Ontario, and the Prairie Provinces. It is reported that the shelter belts on at least 10,000 square miles of land in central Saskatchewan are very severely infested by this species.

GENERAL FEEDERS

GRASSHOPPERS (Acrididae)

- Ohio. T. H. Parks (June 24): Grasshoppers are present in no more than normal numbers. We anticipate no injury.
- Indiana. J. J. Davis (June 25): Grasshoppers are showing up in unusual abundance. Present indications are that they will be more abundant than for many years in the counties adjoining Illinois and in the northern part of the State. The young hoppers were hatching early in June.
- Illinois. W. P. Flint (June 23): Grasshoppers are still hatching in the heavy sod in the central area. The organized fight has been very effective, and this, aided by heavy rains, has greatly lessened the threat of serious injury.
- Michigan. Ray Hutson (June 18): Grasshoppers have practically all hatched.
- Iowa. C. J. Drake (June 23): Grasshopper infestation coincides very closely with the egg survey. Baiting is being carried on extensively in the western counties along the Missouri River. In the eastern half of the infested area the young hoppers are hatching in large numbers. G. C. Decker reported this morning that he had never seen such heavy infestations of young hoppers as he was now finding in Plymouth and Sioux Counties. Melanoplus mexicanus Sauss., M. differentialis Thos., M. femur-rubrum Deg., and M. bivittatus Say are the predominating species.
- Missouri. L. Haseman (June 23): Throughout southwestern Missouri the excessive rainfall of the last 3 weeks has had a decidedly deleterious effect on grasshoppers. Throughout central and northern Missouri and in scattered areas throughout southern Missouri grasshoppers continue to be threatening. In central Missouri the lesser migratory locust and a closely related species or variety are already maturing and mating, and the females at this time contain fully developed eggs.
- Arkansas. Dwight Isley (June 21): There has been an outbreak in northern Arkansas. The damage was caused largely by nymphs of M. mexicanus.
- North Dakota. F. G. Butcher (June 22): Grasshoppers are abundant, many places having populations as high as 50 to 75 per square yard; generally in the third instar. M. mexicanus is decidedly predominating. Crop injury being reported, particularly, to cereals and alfalfa.
- Kansas. H. B. Hungerford (June 5): Young grasshoppers are more abundant in places than we expected.

H. R. Bryson (June 23): Grasshoppers are causing injury over most of the State. The population indicates that control measures must be rigidly applied to avoid serious damage. There is some evidence of parasites and disease. The first adult migratory grasshopper was taken

on May 31, and the first adult of the two-lined grasshopper (M. bivittatus) on June 16 in Riley County.

Oklahoma. F. A. Fenton (June 21): Grasshoppers have not been so destructive as they were in 1936 and the infestation is decidedly more spotted. M. mexicanus is now in the adult stage, and there are a few adults of M. bivittatus and M. differentialis. The most severe infestation will probably be in the panhandle section and caused by Dissosteira longipennis. Thos., great numbers of which are reported from Cimarron County.

C. F. Stiles (June 23): During the past 10 days the weather has turned dry and the damage from hoppers is increasing. The most heavily infested counties are in the southwestern part of the State. The predominating species are M. bivittatus, M. differentialis, and M. mexicanus. The species most prevalent in the panhandle is D. longipennis. H. T. Rainwater reports them there in enormous numbers. In one instance he reported seeing a line about 20 or 30 feet across and 3 miles long that was practically solid with hoppers.

Texas. F. L. Thomas (June 5): Grasshoppers are causing considerable concern in a number of counties.

Montana. H. B. Mills (June 24): In many areas grasshoppers are extremely abundant but rather spotted.

Colorado. S. C. McCampbell (June 28): The infestation of grasshoppers, including D. longipennis, is the heaviest in the history of the State. We are carrying on an intense control campaign against D. longipennis.

Utah. G. F. Knowlton (June 17): Grasshoppers are seriously destructive in some parts of Utah. The cold, unsettled spring appears to be retarding development although the nymphs and some adults are abundant in many northern localities.

Nevada. G. G. Schweiss (June 18): Grasshoppers have been reported as being extremely numerous in Lyon, Pershing, Washoe, and Elko Counties. Control measures have been instituted in these counties. The outbreaks are rather limited in scope. Camnula pellucida Scudd. and M. mexicanus are the species involved.

Arizona. C. D. Lebert (June 10): There was an extremely heavy infestation in alfalfa and melon fields northwest of Phoenix. M. differentialis was on the margins of the fields and fence rows and ditch banks. M. mexicanus was destructive to alfalfa; estimated population of from 300 to 400 hoppers per square yard. Nearly total defoliation of alfalfa, and three rows of melons gone. Some Trimerotropis spp. were present.

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California. S. Lockwood (June 19): C. pellucida was found/damaging numbers for the first time in the recollection of the writer in the Upper Sonoran zone in Merced County.

Tennessee. G. M. Bentley (June 1937): M. differentialis and M. femur-rubrum are occurring in large numbers in several counties. This is the worst outbreak in Tennessee for the past thirty odd years. Due to the dry weather of last year large acreages of land, which could not be turned in the fall, afforded ideal egg-laying areas.

L. B. Scott (June 21): The infestation continues to increase in western Tennessee. All crops have been damaged but tobacco and corn have been most severely injured. Many fields, particularly of tobacco, have been completely destroyed. M. femur-rubrum predominates.

Alabama. J. M. Robinson (June 19): On June 14 grasshoppers were reported to be in large enough numbers to be considered an outbreak in Limestone County, in the central part of the State on the northern border. We found that there were several species occurring in large numbers in that area. Furthermore, grasshoppers are in abundance in central and northern Alabama generally. The nymphs of the lubber grasshopper, Romalea microptera Beauv., were reported as present in Birmingham on June 7 and in Talladega on June 14.

Mississippi. C. Lyle (June 24): Grasshoppers have been destructive to cotton and soybeans in some areas of the State, especially in the Delta. M. femur-rubrum and M. mexicanus are the principal species involved.

MORMON CRICKET (Anabrus simplex Hald.)

Montana. H. B. Mills (June 24): Mormon crickets appeared as adults in the Yellowstone Valley about June 5. Numerous adults were seen in Chouteau County June 22. They are extremely abundant and widespread throughout central Montana.

Utah. C. J. Sorenson (June 18): Mormon crickets are very abundant in Juab, Millard and Tooele Counties.

Washington. The Fresno Bee, Associated Press, (June 21) Mormon crickets are being fought with spray guns along a 35-mile trench line near Pasco, Franklin County, in southeastern Washington. Sea gulls from the Pacific coast have flown into the region and are devouring the crickets.

WIREWORMS (Elateridae)

Maine. J. H. Hawkins (May 11): Agriotes mancus Say is present at the rate of 10 to 40 per square yard in fields at Knox, Waldo County, where potatoes were seriously injured during the past season. Both larvae and adults are present.

Connecticut. A. W. Morrill, Jr. (June 1): Limonius ectypus Say: In Hartford County one oat field, formerly tobacco, was a 50 per cent loss. Many

tobacco fields needed resetting of small areas. One 5-acre shade tent needed entire resetting.

- North Carolina. W. A. Shands (June 25): Reports have been received indicating that wireworm injury on newly set tobacco has been unusually severe in the vicinity of Rocky Mount and over most of the eastern part of North Carolina. While not common, this injury has also been found over the central part of the State.
- Georgia. O. I. Snapp (June 17): Wireworms are more abundant than usual at Fort Valley, central Georgia, and have caused considerable damage to vegetables. In one case they completely destroyed seven rows of onions.
- Indiana. J. J. Davis (June 25): Wireworms damaged tobacco at Rockport June 14.
- Iowa. C. J. Drake (June 23): Wireworms totally destroyed a 20-acre field of corn in central Iowa. The field was in corn in 1936 and in oats in 1935. Last year corn yielded around 45 bushels per acre.
- Kansas. H. R. Bryson (June 22): Injury by Melanotus spp. was more pronounced this spring owing to the unfavorable soil condition which retarded germination of early planted seed. Reports of injury to corn and wheat have been received from the eastern border of the State.
- Idaho and Oregon. F. Shirck (June 15): Wireworms have caused extensive injury to sugar beets, having destroyed 30 to 60 percent of the plants in many fields in southwestern Idaho and eastern Oregon. The unseasonably cool weather has been favorable to continued feeding.
- Oregon. H. P. Lanchester (June 21): A 30-acre field of peas 3 miles west of Weston was plowed under owing to injury by Limonius spp.

WHITE GRUBS (Phyllophaga spp.)

- Connecticut. W. E. Britton (June 23): The beetles devoured the foliage of small Japanese and Chinese chestnut trees at Bristol. Some were entirely defoliated and the owner thinks they have been killed. Sixty-eight adults of P. tristis F. were received June 1, on raspberry from Orange.
- Ohio. T. H. Parks (June 24): May beetles caused partial defoliation of oaks in many parts of Ohio. This injury occurred principally during the first week of June.
- Michigan. R. Hutson (June 18): June beetles have been especially numerous in the vicinity of Okemos, Climax, and Kalamazoo, in south-central Michigan.
- Iowa. C. J. Drake (June 23): There was a very heavy flight of June beetles in central Iowa this spring. White grubs are doing considerable damage in cornfields in eastern and southern Iowa. The State nursery, about 2 miles south of Ames, is being injured by grubs of brood B.
- Kansas. H. B. Hungerford (June 5): White grub injury is strawberry patches is severe.

H. R. Bryson (June 26): Adults of white grubs, P. lanceolata Say, were numerous between June 7 and 14 on the golf courses and higher prairies in the vicinity of Manhattan. The adults were quite heavily parasitized by a sarcophagid. Reports have also been received from Harper and Kingman Counties.

ORIENTAL BEETLE (Anomala orientalis Wtrh.)

North Carolina. J. F. Cooper (June 29): On June 21 and 23, specimens of this beetle were collected on rose and hollyhock at East Spencer, Rowan County in west-central North Carolina.

JAPANESE BEETLE (Popillia japonica Newm.)

New Jersey. T. L. Guyton (June 22): First adult of the season found on potato at Bound Brook.

E. Kostal (June 26): Beetles becoming numerous at Morganville, Monmouth County, which is unusual for this date. Prospects of heavy infestation.

Delaware. L. A. Stearns (June 23): The first adults were observed at Newark on June 13. They are now becoming abundant generally throughout New Castle County. Grub infestation is much greater than in 1936.

Maryland. E. N. Cory (June 22): First record for the season from Conowingo on June 17; University Park, June 22; College Park, June 21.

Washington, D. C. J. A. Hyslop (June 8): One specimen collected in a city back yard today and brought to this office.

ROSE CHAFER (Macrodactylus subspinosus F.)

Massachusetts. A. I. Bourne (June 23): Within the last 2 or 3 days it has been causing serious damage to peach foliage in Worcester County, in the central part of the State. In the Connecticut River Valley it has caused considerable injury to foliage of apple. This morning our attention was called to a severe outbreak in a raspberry planting. The beetles were riddling the foliage.

Connecticut. M. P. Zappe (June 15): Very abundant in shore towns east of New Haven and causing injury to apples in sprayed orchards at Guilford; also reported as causing severe injury to garden plants in New Haven and Woodbury, and to walnut in Bridgeport. This insect was also noted by W. E. Britton, June 17, on rose leaves and the flowers of Iboia privet at Waterbury.

Connecticut. E. P. Felt (June 22): Rose chafer was extremely abundant and very injurious to various plants and ornamental shrubs at Darien.

New York. N. Y. State Coll. Agr. News Letter (June 21): Rose chafers are occurring in Ulster, Columbia, and Dutchess Counties on grapes, peaches, and



mond, on which 100 acres of corn was planted, a lot of damage by several species of cutworms was noted May 28. The cutworms were thought to be the black cutworm (Agrotis ypsilon Rott.), with a few spotted (Agrotis c-nigrum L.) and bronze cutworms (Nephelodes emmedonia Cram.), present.

Georgia. T. L. Bissell (June 9): Pepper plants set in a field that was grassy last year have been attacked by cutworms. About half of the field required replanting. The infestation occurred at Experiment, Ga.

Alabama. J. M. Robinson (June 19): One of the noctuid larvae was reported as doing serious damage to bean pods at Anniston on June 12.

Mississippi. C. Lyle (June 24): Specimens of the variegated cutworm (Lyco-photia margaritosa saucia Hbn.) were received at this office with the statement that they were causing serious injury to bur clover at Yazoo City on May 24.

Indiana. J. J. Davis (June 25): The yellow-striped armyworm (Prodenia ornithogalli Guen.) was abundant and destructive at Milton and Otterbein and other points in central Indiana the middle of the month.

C. M. Packard (June 22): Moths of L. margaritosa saucia were noted on cherry trees at West Lafayette. The fruit is ripening.

Illinois. W. P. Flint (June 23): The yellow-striped armyworm is very generally distributed over all of the State and is found in a wide variety of crops, including both grasses and legumes. Serious damage has been reported. The variegated cutworm is abundant in and destructive to alfalfa.

Iowa. C. J. Drake (June 23): The variegated cutworm is doing extensive damage in many alfalfa and sweetclover fields; populations running from 10 to 40 per square foot in the more heavily infested area.

C. J. Drake (June 23): The yellow-striped cutworm is abundant in almost every county throughout the southern half of the State. The county agent of Guthrie County reported that this insect had totally destroyed a 65-acre cornfield.

Missouri. L. Haseman (June 23): The variegated cutworm, combined with a smaller number of the greasy cutworm (A. ypsilon) and more recently seemingly the fall armyworm (Larhygma frugiperda S. & A.), developed along with the recent armyworm epidemic. Relatively little cutting off of the plants occurred but the cutworms feed rather like armyworms. The cool, rainy weather prolonged the feeding.

North Dakota. F. G. Butcher (June 22): Cutworms are abundant in the eastern counties and much damage to corn, other cereals, and gardens is being done.

F. G. Butcher (June 22): The pale western cutworm (Parosagrotis orthogonia Morr.) is exceedingly abundant and causing excessive crop destruction west of Burleigh and Pierce Counties. Estimates of crop

destruction range from 10 percent in Logan County to 75 percent in Stark County of seeded crop. At least 80 percent of the larvae are full grown at this date, but some injury is being reported.

Nebraska. H. H. Walkden (June 1): Approximately 25 acres of wheat in Dawes County in northwestern Nebraska has been damaged by P. orthogonia. This is the first record of injury by this species in Nebraska as far as I know.

Kansas. H. R. Bryson (June 26): The variegated cutworm is in approximated outbreak proportions in the eastern third of Kansas and some other localities. The cotton cutworm (P. ornithogalli) is occurring in Brown, Doniphan, and Leavenworth Counties in northeastern Kansas on garden truck.

Colorado. S. C. McCampbell (June 28): Last week there was a very heavy flight of moths of C. auxiliaris in the eastern part of the State, extending into the mountains to an elevation of 8,000 feet.

Utah. G. F. Knowlton (June 9): Cutworms are damaging eggplant, cucumbers, and tomatoes at Spanish Fork and garden plants at Brigham.

: BEET WEBWORM (Loxostege sticticalis L.)

North Dakota. J. A. Munro (June 22): The moths of the sugar beet webworm are abundant at Fargo and reports accompanied by specimens indicate that they are exceedingly abundant in the vicinity of Verona, La Moure County, and Fullerton, Dickey County.

Utah. G. F. Knowlton (June 1): Sugar beet webworms have been hatching in the vicinity of Ogden. Tremendous numbers of adult moths are worrying the farmers at Panguitch and in other parts of Garfield County.

Utah and Idaho. H. E. Dorst (June 15): Larvae are becoming numerous on beets. Spraying has been undertaken in Sevier Valley and in Utah County, Utah, and in Franklin County, Idaho.

GARDEN WEBWORM (Loxostege similalis Guen.)

Kansas. H. R. Bryson (June 26): Noted on June 23 a definite outbreak of the garden webworm. Reports of injury have been received from several places in the State, particularly in the eastern half and in the vicinity of Manhattan. Injury has been observed in alfalfa, corn, and in gardens.

Texas. F. L. Thomas (June 22): Some fields of young cotton near Temple, Bell County, were almost completely destroyed by L. similalis. The insect has also caused injury to alfalfa in Hunt County in northern Texas.

A WEBWORM (Loxostege sp.)

Washington. E. W. Jones (June 21): A webworm was found destroying spring onions and carrots at Walla Walla after migrating from a young alfalfa

field where they had been feeding on alfalfa and weeds.

EUROPEAN EARWIG (Forficula auricularia L.)

Washington. E. W. Jones (June 21): The earwig is very abundant in park districts of Walla Walla. Home flower gardens were attacked by the young nymphs. They were reported as becoming a pest on sleeping porches.

CEREAL AND FORAGE-CROP INSECTS

WHEAT AND OTHER SMALL GRAINS

HESSIAN FLY (Phytophaga destructor Say)

Missouri and Kansas. E. T. Jones (May 1937): Limited surveys of fall-brood hessian flies in southwestern Missouri and central, eastern, and southern Kansas indicated only light, widely scattered infestations. Observations indicate very light infestations of first spring-brood flies over this area.

ARMYWORM (Cirphis unipuncta Haw.)

Delaware. L. A. Stearns (June 8): Serious infestation on crops was noted on wheat and corn at Taylors Bridge, New Castle County.

Maryland. E. N. Cory (June 4): Two small outbreaks in Worcester County.

Virginia. D. W. Jones (June 3): The highest infestation is in Northampton County between Eastville and Cheriton. Pupation is well under way and most of the remaining larvae are at least $1\frac{1}{2}$ inches long. The cement road near the worst infested field is almost greasy from the caterpillars that have been crushed by automobiles. One field showed an average of nearly 200 worms per square foot. A pea field across the road, and separated from it by two deep ditches showed an average of 10 worms per running foot of row for 30 feet and was practically clean in the remainder of the field (there was chickweed in the row with the pea vines). An infestation nearly as bad was about 3 miles west in about 100 acres of wheat and vetch. Stacks of cut straw about 6 feet in diameter showed many worms in both Eastville and Cheriton. Some were up in the straw but most of them were on the ground and in moist trash, especially about a foot from the outer edge of the stack. In shaking the straw and making square-foot counts in 20 places, the average was 182 per square foot and seemed to run quite uniformly. Some pupae were noted in this situation and some cocoons of a braconid parasite. The farm roads and ditches showed frass and dead worms $\frac{1}{4}$ inch deep in many places.

Virginia. A. M. Woodside (June 23): A heavy infestation was reported near Timberville, in Rockingham County, on June 4. Barley was damaged heavily by the larvae which cut off many of the heads. Wheat was also damaged to some extent.

Ohio. T. H. Parks (June 24): We are now in the midst of an armyworm outbreak. Injury first occurred in Butler County, southwestern Ohio, the second week in June. It has continued uninterrupted but is now on the wane. Some fields of fall barley have been almost entirely destroyed. A few fields of rye have been seriously damaged and the new seeding of timothy in wheat fields has been destroyed over a wide area. Wheat was not seriously damaged. Corn was damaged very little. The larvae are now entering the ground and pupating. No moth emergence has occurred here. Heavy moth flights from the South have been in progress the last two nights. Last night I was called to see a cherry tree where the ripening fruits had been punctured by the moths which fed upon the fruits and destroyed them in two nights. The moths were observed carrying out their destruction of cherries.

Indiana. J. J. Davis (June 25): The armyworm has been the outstanding problem of the month. The abundance of moths, followed by weather favoring the rank growth of grasses and cool weather checking the activity of parasites, was abundant evidence for anticipating the outbreak. First reports came from Boonville, in the extreme southern end of the State, on May 29. Thereafter reports were received of outbreaks and damage to timothy, barley, wheat, and corn from almost every county in the southern half of the State and as far north as Rennselaer and Delphi. In the extreme northern end of the State, in St. Joseph County, came reports of outbreaks on June 21. Throughout the southern half of the State parasites are now abundant and we expect will check any succeeding broods, although at Lafayette the moths have been exceedingly abundant the past three nights.

Indiana. C. M. Packard (June 22): Moths were abundant last evening around spirea bushes and ripening cherries at West Lafayette. One moth was noted feeding on coreopsis blossom.

Illinois. W. P. Flint (June 23): A general outbreak occurred over the southern three-fourths of the State, some damage occurring in every county. The infestation was quite spotted, most of the damage being done to timothy, bluegrass pastures, and corn. In only a few cases was the destruction complete. Warning of the outbreak was given a month ahead of the appearance of the worms, so that counties were prepared to poison by the time larvae appeared.

Kentucky. W. A. Price (June 25): Armyworms appeared rather generally over the central and western parts of the State during the latter part of May and the early part of June. Their attacks were centered largely on barley.

Iowa. C. J. Drake (June 23): The true armyworm is extremely abundant in the State. Infestations have been reported in about 40 to 50 counties, where small grain and corn have been destroyed.

Missouri. L. Haseman (June 23): As a result of the flight of moths from the south early in May, we had, throughout the latter part of May and up to June 20, probably the heaviest infestation of larvae that ever occurred in this State. The infestation covered practically all of the State.

east of a line extending from southwestern Missouri in a northeasterly direction to near the middle of the State on the Iowa border. Some fields of barley have been completely destroyed and damage was serious to fields of wheat, timothy, and alfalfa, also to meadows and pastures. The larvae began maturing about June 10 and from June 15 to 22 the air was filled with moths on cloudy days and toward sundown, as well as during the night. As in the past, most of the moths have moved out presumably northward and are likely to cause an outbreak in Northern States in July. The moths were still abundant on the night of June 22 at Columbia.

Kansas. H. B. Hungerford (June 5): Armyworms have been very injurious about Lawrence.

H. R. Bryson (June 26): Armyworms were abundant in the eastern third of the State June 2.

Oklahoma. F. A. Fenton (June 21): As expected, the armyworm outbreak subsided and an interesting aftermath has been the enormous numbers of Calosoma spp., which are very prevalent.

CORN

CHINCH BUG (Blissus leucopterus Say)

South Carolina. F. Sherman and W. C. Nettles (June 21): The chinch bug has been abundant in York, Chester, and Lancaster Counties in the north-central section of the State, having migrated from small grains nearby.

Alabama. J. M. Robinson (June 22): Specimens taken from corn following oats at Livingston, on the western border of the State near the center.

Mississippi. C. Lyle (June 24): J. P. Kislenko reported chinch bugs injuring corn at Laurel on June 11. A complaint of damage was received from Soso on June 21. A light infestation was reported on corn at Durant by D. W. Grimes.

Mio. T. H. Parks (June 24): Heavy rains throughout June have greatly lessened the chances of chinch bug injury. We have a report from only one county where the bugs are said to be rather abundant. Before the rains they were rather common in some fields of wheat and spring barley. The new brood began hatching during the second week of June.

Indiana. J. J. Davis (June 25): Chinch bugs are showing up in conspicuous numbers from many places in the western two tiers of counties from Greene County northward.

Iowa. H. E. Jaques (June): Chinch bugs are moderately abundant in southern Iowa.

ansas. H. R. Bryson (June 26): Scarcer this summer than for a number of years. Only one report of injury has been received. Barriers will not be required to protect corn.

Oklahoma. F. A. Fenton (June 21): In the northeastern part of the State the chinch bug is apparently more abundant than at any time since 1934.

CORN EAR WORM (Heliothis obsoleta F.)

Virginia. A. M. Woodside (June 23): Moths were numerous in codling moth bait pails for a week during the latter part of May at Staunton.

South Carolina. F. Sherman and W. C. Nettles (June 21): The corn ear worm is serious on vetch in the Piedmont. It is also reported on cotton, corn, sugarcane, and fruit of tomato.

Georgia. O. I. Snapp (June 17): The tomato fruit worm is very abundant this year and has seriously damaged tomatoes at Fort Valley, central Georgia. Besides damaging the fruits, they are even attacking the vines.

T. L. Bissell (June 8): Serious injury to green tomatoes is reported at Cuthbert and Pelham, in southwestern Georgia. One field was a total loss and had to be plowed up. At Griffin, in central Georgia, a severe injury to 1 acre of tomatoes was reported. Half-grown larvae are in the fruit and blossoms and are occasionally boring into the stems. At Orchard Hill, in central Georgia, worms are two-thirds grown and are leaving vetch to feed on small cotton leaves. (June 17): Larvae are eating into seed heads of flax at Hawkinsville, in central Georgia. It is reported that the loss of heads ranges from 3 to 5 percent. (June 22): Investigated tomato infestation at Cuthbert, where the insect was causing severe loss, on June 7. Today larvae are very hard to find-saw two this afternoon. The disappearance does not appear to be due to use of insecticides, although much arsenical insecticide and some rotenone was used.

Indiana. J. J. Davis (June 23): The tomato fruit worm is very abundant, entering green tomatoes in Gibson County in the southern end of the State. This is perhaps earlier than usual and heavy infestations in tomatoes and corn may be anticipated before the season is over.

Kansas. H. R. Bryson (June 22): Causing considerable injury to the curl of corn. The larvae have been taken in tomato fruits.

Alabama. J. M. Robinson (June 19): The corn ear worm is active on corn, attacking the ears of the older and the buds of the younger corn.

Mississippi. C. Lyle (June 24): The corn ear worm has been reported as causing heavy damage to tomatoes over the entire State. J. Milton writes that one grower in Hinds County reported a 25 % loss of his tomato crop.

Louisiana. C. O. Eddy (June 25): Larvae have been very abundant the last month. Birds have torn open ears of corn and fed on the larvae.

Texas. F. L. Thomas (June 22): Seems to be more abundant than usual in Central Texas, probably because of the unusually dry weather and poor condition of corn. Also reported on tomato, corn, and sweet peas in Galveston County in May.

SOUTHERN CORNSTALK BORER (Diatraea crambidoides Grote)

- South Carolina. F. Sherman and W. C. Nettles (June 21): The southern cornstalk borer is prevalent, chiefly in the Piedmont section.
- Florida. A. H. Madden (June 12): One field of corn in the eastern part of Gadsden County had from 20 to 30 % of the stalks damaged. Other fields were also infested.
- Georgia. T. L. Bissell (June 16): At Clarkston, in north-central Georgia, three larvae were found in the leaves of one plant. (June 21): At Milner, in central Georgia, a field of corn is beginning to tassel and about one-fourth of the stalks are infested—none broken, but leaves ragged. (June 23): At Cordele, in south-central Georgia, a field is beginning to silk and about 10 percent of it is infested. Found one pupa in a stalk.

A WEBWORM (Crambus sp.)

- Virginia. C. R. Willey (June 14): A species of webworm was noted on May 28 doing considerable damage on a 100-acre tract of land planted in corn on the James River, west of Richmond.
- Kentucky. W. A. Price (June 25): Adults of sod webworms continue to be abundant and the larvae have caused much damage to such cultivated crops as corn and tobacco.

LESSER CORNSTALK BORER (Elasmopalpus lignosellus Zell.)

- Georgia. Oliver I. Snapp (May 27): The lesser cornstalk borer is damaging young corn at Fort Valley, central Georgia.

EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

- Connecticut. N. Turner (June 22): Eggs now hatching. Infestation in Housatonic Valley very heavy. Preliminary observations in Connecticut Valley indicate less egg laying than last year.
- New Jersey. E. Kostal (June 26): Heavy infestation in rhubarb and sweet corn at Morganville, in Monmouth County. Moderate infestation in potato stems.

SUGARCANE BEETLE (Euethola rugiceps Lec.)

- Virginia. C. R. Willey (June 14): Specimens were sent by a correspondent at Laban, Mathews County, who said they are very numerous in cornfields in his section and are doing lots of damage; also that there have been severe infestations since the flood in this area in August 1933.
- Mississippi. C. Lyle (June 24): The rough-headed cornstalk beetle has caused considerable damage this spring. During the first half of June it was reported injuring sugarcane, corn, and cotton.

CORN FLEA BEETLE (Chaetocnema pulicaria Melsh.)

New York. N. Y. State Coll. Agr. News Letter (June): The corn flea beetle has heavily infested corn in Nassau County, Long Island. Every plant shows feeding marks and early wilt-resistant sweet corn has about 2 % wilt.

CORN ROOT APHID (Anuraphis maidi-radici Forbes)

Kansas. H. R. Bryson (June 26): The corn root aphid has been reported as severely damaging corn in Doniphan County.

ALFALFA AND CLOVER

ALFALFA WEEVIL (Hypera postica Gyll.)

Nebraska. L. M. Gates (June 23): A survey being conducted in northwestern Nebraska indicates a reduction in the numbers of alfalfa weevil in the area. No new infestations have been found and some of the fields found infested in 1936 were not infested this year. The development of the species seems to have been delayed from a week to 10 days. Eggs, first-fourth-stage larvae, and last year's adults are present in the infested fields in northern Sioux County near the South Dakota and Wyoming State lines.

Idaho. R. W. Haegele (June 16): The alfalfa weevil is about the same as in 1936 in southwestern Idaho. Infestations are spotted, with damage ranging from negligible to about 20 % of the first crop. Larvae are mature and pupating, and the first crop of alfalfa is being cut.

Nevada. G. G. Schweis (June 18): The alfalfa weevil has caused some damage in western Nevada. The counties affected most are Churchill, Lyon, Washoe, and Douglas.

Utah. G. F. Knowlton (June 10): In many northern localities damage is becoming more conspicuous.

California. A. E. Michelbacher (June 21): The alfalfa weevil population is a very low ebb. The average number of larvae collected to 100 sweeps of an insect net in the infested area on June 14 ranged from less than 1 to 15, while the adult count ranged from 0 to 28. The population is the lowest encountered for this time of the year since the investigation was started in 1932. Parasitization by Bathyplectes curculionis Thos. on May 28 ranged well above 90 % and in a number of cases was over 95 %.

CLOVER LEAF WEEVIL (Hypera punctata F.)

Indiana. J. J. Davis (June 25): The clover leaf weevil was destructive to clover and alfalfa in DeKalb County the last of May and the first of June.

H. R. Painter (May 26): A heavy infestation by the two weevils H. punctata and H. nigrirostris F. was seen in a clover field in Lake County. Clover had been seriously damaged by H. punctata but at the time of observation this specie was almost totally destroyed by disease.

Illinois. W. P. Flint (June 23): Adults are now so abundant that they are injuring the new growth of alfalfa where the crop has been cut.

Missouri. L. Haseman (June 23): During the middle of the month numerous complaints came into the office that clover leaf weevils were destroying the second crop of alfalfa. The complaints were usually accompanied by specimens. The wet, cool weather evidently favored the maturing of the larvae, resulting in an unusually heavy brood of adults. However, much of the damage to alfalfa attributed to the weevil was done by cutworms and armyworms.

Kansas. H. R. Bryson (June 22): Adults appeared in sufficiently large numbers in certain alfalfa fields in the eastern third of Kansas to prevent new growth following the first cutting.

Arkansas. Dwight Isely (June 21): There has been a serious local injury to alfalfa in northwestern Arkansas, particularly in Boone and Carrol Counties.

GRASS THRIPS (Frankliniella spp.)

California. L. G. Jones (June 5): Alfalfa in the Antelope Valley was severely damaged by the grass thrips F. occidentalis Perg. and F. moultoni Hood. Seasonal conditions early in the spring were favorable for thrips to multiply in the grasslands throughout the valley and, as the vegetation dried, the thrips migrated to the alfalfa fields. The migration started about May 1 and by May 28 three-fourths of the leaves on the alfalfa plants were badly deformed and somewhat skeletonized.

FIELD CRICKET (Gryllus assimilis F.)

Arizona. L. R. Stitt (June 22): Appear to be more numerous than last year in the Yuma Valley, but there is no noticeable damage. The alfalfa seed crop is developing and damage to the crop is likely to occur soon. Damage was heavy in 1936 and was 80.5 % in 1934.

COWPEAS

COWPEA CURCULIO (Chalcodermis aeneus Boh.)

South Carolina. F. Sherman and W. C. Nettles (June 21): Specimens of the cowpea pod weevil were sent in from various sections as injuring beans and young cotton plants.

Georgia. T. L. Bissell (June 22): At Springvale adults appeared on string beans and pods were punctured but no eggs were found. (June 23): At Cordele, in southcentral Georgia, adults were thick on cowpea plants.

Some were leaf feeding. One pod found with an egg and a small grub. None on cotton at Fort Valley, central Georgia, which was infested May 27. The stand was cut less than 5 %, not 20 %, as I reported in the Insect Pest Survey Bulletin, June 1937 (vol. 17, no. 4, p. 191). At Experiment, central Georgia, adults have been slow appearing on cowpeas but are now moderately abundant. As yet there are no pods for them to infest.

SORCHUM

THIEF ANT (*Solenopsis molesta* Say)

Kansas. H. R. Bryson (June 26): On May 27 the Kafir ant (*S. molesta* Say) was reported as destroying planted kafir seed in Douglas and Wabunsee Counties, in east-central Kansas.

California. C. C. Wilson (June 9): In May an unusual infestation occurred near Wheatland, in Yuba County in the Sacramento Valley, where this ant was noted as a pest of milo maize. Two consecutive plantings of seed on 110 acres have been destroyed. Soil examinations were made and the number of ants ranged from 10 to 48 per $2\frac{1}{2}$ feet of drill row.

VETCH

VETCH BRUCHID (*Bruchus brachialis* Fahraeus)

North Carolina. L. J. Bottimer (June 26): On May 2 the writer collected several adults on flowers of *Vicia villosa* at Princeville in Edgecombe County, and one on the same host plant at Scotland Neck in Halifax County. These collections add two new counties to the infested area of the State.

SUGARCANE

SUGARCANE BORER (*Diatraea saccharalis* F.)

Louisiana. B. A. Osterberger (June 25): The sugarcane borer infestation in the Lafourche section of southern Louisiana in the corn, ranges from 45 percent to nothing, with an average of 10 percent; 34.3 percent of the eggs collected parasitized by *Trichogramma* sp.

L. O. Ellisor (June 25): Examination of sugarcane in West Baton Rouge Parish during the last 2 weeks showed that in some fields as high as 5 percent of the plants were damaged by the first generation. This represents an average of about 1,700 borers per acre. On June 25, 116 masses of eggs were collected in a field of corn. Of these 61 percent were either wholly or partly parasitized by *T. minutum* Riley. No parasites have been released in this field.

Texas. F. L. Thomas (June 22): *D. saccharalis* found in cornstalks throughout May in Galveston County.

FRUIT INSECTS

ROSE LEAF BEETLE (Nodonota puncticollis Say)

New York. N. Y. State Coll. Agr. News Letter (June): Rose leaf beetles began emerging in the Hudson River Valley on June 1, a week later than the date of first emergence last year. The third week in the month the beetles were generally present and injurious in the orchards.

A LEAF MINER (Ornix geminatella Pack.)

Michigan. R. Hutson (June 22): The unspotted tentiform leaf miner is abundant in two orchards in the vicinity of Ionia, south of the center of the State. This insect has been increasing in these orchards for the last 6 years.

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

New York. D. W. Hamilton (June 24): Moths began appearing in bait traps at Poughkeepsie on the night of May 23. Heavy peak flights occurred from May 30 to June 3 and daily captures have gradually decreased since. Ten bait traps located in the same positions have captured 1,566 moths, as compared to 1,443 during the entire season of 1936. Entrances and stings are much easier to find than they were at this time last year.

N. Y. State Coll. Agr. (June): In western New York the moths have been active since May 30. Eggs were observed in Yates County on June 11 and entrance first observed on June 18. Reports from other counties in that part of the State indicate that the hatch has been delayed and entrances to the fruit are few.

Delaware. L. A. Stearns (June 23): The last emergence of spring-brood moths took place on June 14. The earliest first-brood injury was observed in an orchard on June 1 and injury was general by June 23.

Virginia. A. M. Woodside (June 23): The first larvae left the fruit in the insectary at Staunton on June 17, and on June 18 the first were captured in bands. Emergence of the spring brood of moths is complete in the insectary, but moths continue to be captured in the bait pails.

South Carolina. F. Sherman and W. C. Nettles (June 21): There is less damage than usual, presumably because of the light crop of apples last year.

Georgia. C. H. Alden (June 23): First-generation moths have been emerging at Cornelia, in northeastern Georgia, for about 10 days. Eggs are being laid.

Ohio. T. H. Parks (June 24): The first entrances were noticed in southern Ohio on May 28, at Columbus on June 7, at Toledo June 8, and at Wooster June 10. The insect seems to be well under control, as there are not very many larval entrances in orchards that have received two cover sprays. Moths are still caught in bait pails at Columbus and Toledo.

Indiana. J. J. Davis (June 25): The peak of hatching has been passed in all parts of the State. Weather conditions during June have been less favorable for development than normal.

Michigan. R. Hutson (June 18): A general flight took place at Shelby on June 1. Moth emergence has been rather scattered in other sections of the State.

Missouri. L. Haseman (June 23): There have been only a few days difference in the dates of moth emergence in the south, central, and northern parts of the State. A few scattered moths of the first brood are still being taken in the bait pans throughout the southern and central parts of the State in larger numbers, particularly from the northwestern part. We found the first evidence of first-brood larvae leaving fruit and spinning up under the bands in southern Missouri last week.

H. Baker (June 28): The first moths were caught in bait traps at Saint Joseph on May 16, and peak catches were taken during the period May 21 to 29, and catches have been light since June 8. The first attempted entrances were observed on May 29 and the first exit of a mature larva from fruit was observed on June 17. Catches of spring-brood moths were heavier by far than at any time since 1934 but cool, rainy weather during the period of peak moth activity held egg laying and larval activity to minimum and few first-brood larvae can be found in orchards.

Kansas. R. L. Parker (June 26): Moderately abundant in northeastern Kansas.

Washington. E. J. Newcomer (June 19): The spring-brood flight in the Yakima Valley reached its peak from May 30 to June 1, about 10 days later than the peak in 1936. Owing to the cool, rainy weather, there has been very little activity since that time.

EASTERN TENT CATERPILLAR (Malacosoma americana F.)

Maine. H. B. Peirson (June): Hatching in southwestern Maine was observed on April 27 and tents were noticeable on May 5.

H. N. Bartley (June 14): Serious injury is occurring in southwestern Maine.

New Hampshire. J. G. Conklin (June 24): Cocoons of the eastern tent caterpillar were first observed on May 31 in southern New Hampshire.

Vermont. W. E. Roberts (June 4): Nearly all the wild cherry that has not been sprayed in Rutland and Addison Counties is completely defoliated.

Massachusetts. A. I. Bourne (June 23): The eastern tent caterpillar is again very abundant with no evidence of any reduction in numbers.

Rhode Island. A. E. Stene (May 27): 1/ This insect is again showing up in un-

1/ This note was incorrectly published on page 171 of the Insect Pest Survey Bulletin dated June 1, 1937, under J. J. Davis of Indiana.

usual numbers in some parts of the State; in fact, they are so abundant on some trees that food is scarce and disease is making an inroad.

Delaware. L. A. Stearns (June 18): The first appearance of adults in New Castle County, in northern Delaware was noted on June 4. Disease is very prevalent.

New York. R. E. Horsey (June): These insects have completed their feeding and are crawling around or forming cocoons at Rochester. The first cocoons were noted on June 10.

Pennsylvania. R. M. Baker (June): A scourge of tent caterpillars occurs in a large area in the west-central part of the State, the infestation diminishing around the area. In some sections the larvae were so numerous on the highways that they created traffic hazards.

APPLE APHIDS (Aphididae)

Maine. F. H. Lathrop (June 22): In Kennebec County the first adults of the second generation of Aphis pomi Deg. appeared about June 1. This species is more abundant than usual. Severe infestations developed in some young orchards early in June. Anuraphis roseus Baker is a little more common than usual. This species is not normally important in Maine.

New York. N. Y. State Coll. Agr. News Letter (June): The rosy apple aphid is causing some injury in the Hudson Valley and also in western New York.

Kentucky. W. A. Price (June 25): The rosy aphid is abundant in an orchard at Nancy, Pulaska County, in south-central Kentucky.

Mississippi. C. Lyle (June 24): A correspondent in the northeastern corner of the State reported A. pomi on apple on June 17.

Missouri. L. Haseman (June 23): Some evidence of the rosy apple aphid in orchards in central and southwestern Missouri, although less than usual. Some increase of A. pomi but no particular damage.

Idaho. R. W. Haegle (June 16): Early infestations of the green apple aphid and the rosy aphid in southwestern Idaho have continued. Fruit has been marked and new growth on young trees has been injured.

Washington. E. J. Newcomer (June 19): The rosy aphid is much more numerous in the Yakima Valley than it has been for several years.

APPLE LEAFHOPPERS (Cicadellidae)

Maine. F. H. Lathrop (June 22): A small proportion of the white apple leafhopper (Typhlocyba pomaria McAtee) was mature at Monmouth, in Kennebec County, on June 11. No heavy infestations found this spring.

Massachusetts. A. I. Bourne (June 23): Leafhoppers are appearing in about normal abundance, but are later than usual and the infestation is lasting

longer. In most instances the lower half or two-thirds of the trees carry the infestation and very few hoppers are to be found in the upper branches. This year it was necessary to give the trees very thorough coverage to the tops in order to hold the first brood in check.

Connecticut. P. Garman (June 22): The white apple leafhopper is occurring in New Haven County in about average numbers.

New York. N. Y. State Coll. Agr. News Letter (June): The black apple leafhopper (Idiocerus provancheri Van D.) is common in Greene County, in the Hudson River Valley, and in Wayne County, on Lake Erie. The peak of hatching of the white apple leafhopper occurred between May 25 and 27 in the Hudson Valley. The first adults were observed on June 2.

Virginia. A. M. Woodside (June 23): Adults of the white apple leafhopper are moderately abundant in a few orchards in Augusta County.

Indiana. J. J. Davis (June 25): Apple leafhoppers are showing up in threatening numbers throughout the State.

Missouri. L. Haseman (June 23): There has been some increase in abundance of apple leafhoppers; however, there has been practically no spotting of apple foliage.

APPLE MAGGOT (Rhagoletis pomonella Walsh)

Connecticut. P. Garman (June 22): Emergence of the flies in New Haven County is much earlier than usual.

New York. N. Y. State Coll. Agr. News Letter (June): Flies began to emerge at Poughkeepsie on June 16 and continued to the end of the month.

PEACH

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

New York. N. Y. State Coll. Agr. News Letter (June): Injury was becoming very evident in western New York by the end of the month.

Delaware. L. A. Stearns (June 23): First-brood twig injury is light throughout the State. Parasitization is low in southern Delaware and high in the northern part of the State. Peach drops show moderate infestation.

Georgia. O. I. Snape (June 14): According to a report, considerable damage to twigs and fruit of peach is occurring at Griffin, in north-central Georgia.

T. L. Bissell (June 21): A 3-year-old peach orchard at Experiment is infested. Many terminals are injured and a few larvae were in the fruit.

Mississippi. C. Lyle (June 24): Twig injury was observed in southern Mississippi late in May and early in June.

Indiana. J. J. Davis (June 25): Abundant in northern Indiana, where a fruit crop was harvested last year. In other parts of the State twig injury by the first-brood larvae is not conspicuous, but the trap catches indicate a heavy second brood.

Michigan. R. Hutson (June 22): Second brood is numerous in southwestern Michigan.

PEACH BORER (Conopia exitiosa Say)

Georgia. O. I. Snapp (June 18): The first cocoon of the season was found at Fort Valley on May 28. The moth (a female) had just emerged. The first moth was taken on May 8 last year. Peach orchards in the vicinity have been examined regularly for cocoons since May 4.

T. L. Bissell (June 23): Large larvae are being taken from 3-year-old peach trees at Experiment today.

PEACH TWIG BORER (Anarsia lineatella Zell.)

New York. R. W. Leiby (June 16): An adult was taken at a light trap near a peach tree at Ithaca on June 15. This is the first record of the capture of an adult in New York since 1924, according to W. T. M. Forbes.

Arizona. C. D. Lebert (May 25): The peach twig borer is working in plum and apricot in the Phoenix district. A little fruit injury has been observed recently. One borer was found in pear at Glendale, in the same district, on June 4.

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Maine. F. H. Lathrop (June 22): Emergence of adults from hibernation cages in Kennebec County occurred between May 10 and 31. Egg punctures were noticed on young apples soon after application of the calyx spray.

Massachusetts. A. I. Bourne (June 23): Curculio has been at least normally abundant.

Connecticut. P. Garman (June 22): Abundant in some orchards in New Haven County.

Georgia. O. I. Snapp (June 18): The infestation is still very light at Fort Valley. All of the early varieties of peaches have been harvested and were remarkably free from damage. The first pupation of the season was recorded on May 27. Adults of the first generation began to emerge from soil in the laboratory on June 4, a week later than emergence in 1935 and 1936. A number of new beetles were taken in peach orchards on June 5 by jarring.

T. L. Bissell (June 21): Curculio is very scarce in peach at Experiment.

C. H. Alden (June 23): First-generation beetles began to emerge from soil cages at Cornelia in northeastern Georgia on June 21, when 7 beetles emerged. On June 23, 20 beetles emerged. No eggs or "sting peaches" found in the field.

Mississippi. M. L. Grimes (June 24): This insect is abundant, even on sprayed trees in central Mississippi, on the eastern border.

Texas. F. L. Thomas (June 22): Reports have been received of more than usual abundance of curculio in peach in Smith County, northeastern Texas. Damage is considerably greater than last year.

Michigan. R. Hutson (June 18): The plum curculio was reported from southern Michigan the later part of May and early in June. Later reports indicate an abundance of the insect.

GREEN PEACH APHID (Myzus persicae Sulz.)

Washington. E. J. Newcomer (June 19): The green peach aphid is more numerous in the Yakima Valley than it has been for several years.

LEAF-FOOTED BUG (Leptoglossus phyllopus L.)

Georgia. O. I. Snapp (June 5): These coreids are more abundant than usual on peach at Fort Valley, damaging the ripening fruit.

PEAR

PEAR PSYLLA (Psyllia pyricola Foerst.)

New York. N. Y. State Coll. Agr. News Letter (June): This insect is not causing much injury this year.

Michigan. R. Hutson (June 22): The pear psylla is beginning to appear in unsprayed orchards in the southern part of the State.

PEAR LEAF-CURLING MIDGE (Dasyneura pyri Bouche)

New York. N. Y. State Coll. Agr. News Letter (June 1): Larvae were observed on pear in Ulster and Dutchess Counties, in the Hudson Valley, the last week of May.

PEAR BORER (Conopia pyri Harr.)

Virginia. A. M. Woodside (June 23): Adults of the pear borer were captured in considerable numbers in bait pails at Staunton in June.

CHERRY

CHERRY FRUITFLIES (Rhagoletis spp.)

New York. D. W. Hamilton (June 24): A few flies of R. fausta O. S. were captured.

tured in the emergence cages in the vicinity of Hudson from May 31 to June 2. R. cingulata Loew began emerging in the cages on June 7 and are still appearing in comparatively large numbers.

Michigan. R. Hutson (June 18): R. fausta was reported from Gobles on June 8, from Niles on the 10th, and from Grand Rapids on the 12th.

BLACK CHERRY APHID (Myzus cerasi F.)

Michigan. R. Hutson (June 22): This aphid is numerous in southern Michigan.

Idaho. R. W. Haegeler (June 16): Heavy infestations on cherry in southwestern Idaho.

Utah. G. F. Knowlton (June 17): This aphid is rolling cherry foliage in northern Utah.

PLUM

HOP APHID (Phorodon humuli Schr.)

Indiana. J. J. Davis (June 25): A green aphid, which we believe to be P. humuli, was exceedingly abundant on plum at South Milford, in northeastern Indiana.

MEALY PLUM APHID (Hyalopterus arundinis F.)

Idaho. R. W. Haegeler (June 16): Infestations appeared in Italian prune orchards in southwestern Idaho about June 1 and have increased rapidly. There will be some loss to the crop.

BLUEBERRY

CHAIN-SPOTTED GEOMETER (Cingilia catenaria Drury)

Massachusetts. A. I. Bourne (June 23): During the first week in June a very serious outbreak occurred in blueberry fields in the hill towns in the lower Connecticut River Valley. In 1936 our attention was called to a slight infestation, covering approximately 2 acres, in that section. The late frost of May 1936, however, wiped out the crop. Some of the area was burned over this year early in the spring. The infestation has now spread throughout the Granville section and approximately 50 acres have been completely defoliated. When we visited the fields the insect was advancing about 10 feet a day, leaving havoc in its path. This is the most severe infestation of this pest that we have ever observed.

GRAPE

GRAPE LEAFHOPPER (Erythroneura comes Say)

Delaware. L. A. Stearns (June 23): Infestation over the State is light, owing to continued wet weather throughout the period of first-brood development.

California. M. S. Morley (June 7): Adults are very numerous on untreated grape vines in Kern County.

CURRENT

IMPORTED CURRENT WORM (Pteronidea ribesii Scop.)

Maine. H. B. Peirson (June 9): Larvae were reported as defoliating current at Augusta in southern Maine.

Indiana. J. J. Davis (June 25): Larvae were reported as defoliating current at La Fayette on May 28 and at Winchester on June 3.

CURRENT APHID (Myzus ribis L.)

North Dakota. J. A. Munro (June 22): The current aphid has been abundant, but parasites are holding it in check.

BLACKBERRY

BLACKBERRY LEAF MINER (Metallus rubi Forbes)

Michigan. R. Hutson (June 22): The blackberry leaf miner defoliated a 2-acre field of blackberries near Sandusky, in eastern Michigan.

A PSYLLID (Trioza tripunctata Fitch)

New Hampshire. J. G. Conklin (June 24): Damage by the blackberry psyllid was observed in southern New Hampshire on June 23. Large numbers were ovipositing on terminals of new growth.

PECAN

FALL WEBWORM (Hyphantria cunea Drury)

Georgia. O. I. Snapp (June 23): Nests are common on pecan trees at Fort Valley. Larvae about half grown.

Florida. F. S. Chamberlin (May 27): Very abundant on pecan trees in Gadsden County.

Mississippi. C. Lyle (June 24): According to G. L. Bond and H. Gladney, webs have been noticeable on pecan trees along the Coast since the latter part of May and are now quite numerous. J. E. Lee reports that the webs are beginning to appear in Pearl River County.

ENGLISH WALNUT

A CURCULIO (Conotrachelus juglandis Lec.)

Pennsylvania. A. B. Champlain (June 22): The new growth of English walnut trees in east-central Pennsylvania is being attacked by this curculio.

NAUTICAL BORER (Xylotrechus nauticus Mann.)

California. H. C. Donohoe (June 8): In November, 1936, a number of large limbs in an old planting of English walnuts in Fresno County, in the San Joaquin Valley, broke off. Examination of the trees showed that, although apparently healthy, they were riddled by these borers. This year adults emerged from the material in April and May.

CITRUS

CITRUS WHITEFLY (Dialeurodes citri Ashm.)

Florida. H. T. Fernald (June 23): A new generation of adults is beginning to appear in the vicinity of Orlando.

Mississippi. C. Lyle (June 24): Some heavy infestations on ornamentals in southern Mississippi were observed about the middle of June. N. D. Deets reports the insect as abundant in the southwestern part of the State.

Louisiana. I. J. Becnel (June 25): D. citri is present in all stages on citrus in Plaquemines Parish.

GREEN CITRUS APHID (Aphis spiraeicola Patch)

Florida. H. Spencer (June 24): Infestations have been particularly severe on orange and grapefruit trees in the main citrus district, on lime trees on the Keys, and on terminal new growth of Satsumas in the northern counties. The aphid was first noticed of late in December 1936 on Merritt's Island off the east coast, and during the blooming period considerable damage was done. The outbreak is now rapidly subsiding.

SCALE INSECTS (Coccidae)

Louisiana. I. J. Becnel (June 25): Heavy infestations of Lepidosaphes beckii Newm. are occurring in several citrus groves in Plaquemines Parish. The insect is mostly in the egg stage, although a few crawlers and young nymphs are present. Several heavy infestations of Coccus hesperidum L. are occurring. This species is mostly in the adult stage. Many specimens of L. gloverii Pack are also present.

CITRUS MEALYBUG (Pseudococcus citri Risso)

Florida. H. Spencer (June 14): The citrus mealybug is becoming abundant in orange and grapefruit groves in central Florida and the upper east coast fruit belt.

CITRUS RUST MITE (Phyllocoptes oleivorus Ashm.)

Florida. J. R. Watson (June 25): Rust mites are very abundant in citrus groves. Spraying is general.

Texas. N. O. Berry (June 5): The infestation in the Rio Grande Valley appears to be about normal.

ALMONDS

NAVAL ORANGE WORM (Myelois venipars Dyar)

Arizona. C. D. Lebert (June 14): Larvae found in old nuts and under bark of almonds at Glendale, near Phoenix. No injury to the present crop of almonds.

TRUCK CROP INSECTS

BLISTER BEETLES (Meloidae)

South Carolina. F. Sherman and W. C. Nettles (June 21): The striped blister beetle (Epicauta vittata F.) is reported from the eastern part of the State on beans.

Kentucky. W. A. Price (June 25): Blister beetles were reported to have damaged a field of alfalfa at Mayfield.

North Dakota. J. A. Munro (June 22): Blister beetles, Macrobasis unicolor Kbr. and E. pennsylvanica Deg., are reported to be troublesome in Barnes, Mercer, and Morton Counties.

Iowa. H. E. Jaques (June 23): Blister beetles, both black and gray, appeared unusually early this year and have done some damage to alfalfa.

Missouri. L. Haseman (June 23): We are receiving numerous complaints from various sections of Missouri regarding the abundance of blister beetles attacking second-growth alfalfa, as well as garden and truck crops.

Kansas. H. R. Bryson (June 13): Blister beetles have been causing considerable damage to potatoes, tomatoes, and other garden crops in the vicinity of Kansas City, in Jewell County, and at Manhattan, in Riley County. The beetles appeared in alfalfa fields in greater numbers than usual during June and ate the bloom extensively.

Oklahoma. C. F. Stiles (June 23): Blister beetles have been doing considerable damage to tomatoes in Mayes County.

Alabama. J. M. Robinson (June 19): E. vittata appeared in large numbers as far north as Auburn the last of May on various crops. One farmer had his children take branches and drive the beetles from the cotton into the galberry thickets, where they seemed to be content to feed. During the first 2 weeks of June complaints have been coming in from central and northern Alabama regarding M. unicolor, which has been appearing in large numbers in field crops and gardens. Numbers are sufficient to be considered an outbreak.

Mississippi. C. Lyle (June 24): Blister beetles were reported attacking vegetables at Corinth on June 9, and potatoes at Tupelo and Smithville on June 10 and at Durant on June 19. E. pennsylvanica was damaging potatoes in Grenada and Lafayette Counties in June. E. lemniscata F. was found on cotton at Pontotoc on June 11, and specimens of M. unicolor were received

from a correspondent at Lake Como on June 14.

ouisiana. C. O. Eddy (June 25): The striped blister beetle has been abundant locally in several parts of the State.

FLEA BEETLES (Halticinae)

ew Hampshire. J. G. Conklin (June 24): Flea beetles began appearing in numbers on potato, eggplant, and tomato on June 1 in southern New Hampshire.

ew York. N. Y. State Coll. Agr. News Letter (June 14): Flea beetles are severely damaging lima beans in a garden in Columbia County. Severe injury was reported on June 11 from two plantings of beans totaling from 8 to 10 acres in Cortland County. In Oswego County flea beetles are causing considerable injury to tomatoes, cabbage, and early potatoes. In Niagara County flea beetle injury is not serious except on potatoes.

Ohio. T. H. Parks (June 24): Systema blanda Melsh. was sent in with the report that it was injuring tomatoes.

ndiana. J. J. Davis (June 25): The pale-striped flea beetle was very destructive to corn at Clayton on June 8. Phyllotreta pusilla Horn and P. vittata F. were damaging cabbage at Rockport on June 8.

tah. H. E. Dorst (June 25): Flea beetles are very numerous on sugar beets in the northern portion of Sevier Valley and have destroyed many stands.

STRIPED CUCUMBER BEETLE (Diabrotica vittata F.)

Massachusetts. A. I. Bourne (June 23): There was very little mortality of the striped cucumber beetle and it is more abundant than usual.

Connecticut. N. Turner (June 22): Abundant as usual in southern Connecticut and appeared on squash, melons, and cucumbers.

ndiana. J. J. Davis (June 25): More abundant than usual in some sections of the State, particularly in the large melon-growing districts in Jackson County.

ansas. H. R. Bryson (June 23): D. vittata F. was abundant at Bremen.

Mississippi. C. Lyle (June 24): The striped cucumber beetle was ruining water-melons at Columbus on June 12. M. L. Douglass at Grenada, M. L. Grimes at Meridian, and N. D. Peets at Brookhaven report infestations in their districts.

SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata F.)

Virginia. H. G. Walker and Lauren D. Anderson (June 24): More abundant than usual but has not caused much damage in Norfolk.

North Carolina. W. A. Shands (June 25): This insect has been more abundant at Oxford during June than in June 1936. Although injury to tobacco has been light in comparison to that caused by other insects, it was more serious than in 1936. Severe injury was reported on young watermelon plants.

Georgia. O. I. Snapp (May 27): Has ruined corn in a field that laid fallow last year at Fort Valley, central Georgia.

A SCARABAEID (Strigoderma arboricola F.)

Maryland. E. N. Cory (June 15): Flying in numbers on the beach at Assateague Island and in small numbers in most of the bean and potato fields on the lower part of the Eastern Shore.

SEED CORN MAGGOT (Hylemia cilicrura Rond.)

Connecticut. A. W. Morrill Jr. (June 1): Several shade tents of tobacco in widely scattered locations showed damage, one or two being so severely injured as to necessitate resetting.

New York. R. W. Leiby (June 16): Severe damage to fields of red kidney beans reported from Wayne, Cortland, Monroe, and Tompkins Counties. Damage ranged from 20 to 100 % and the most severely damaged fields, some of which were from 4 to 8 acres in size, were plowed up.

N. Y. State Coll. Agr. News Letter (June 14): Severe damage by this insect and by flea beetles was estimated at nearly 50 % to young bean plants on June 11 from two plantings of beans totaling from 8 to 10 acres. Other reports of similar injury in Cortland County. Two plantings totaling 12 acres of kidney beans in Tompkins County will be plowed up because of practically total loss. This insect caused losses to spinach grown this year in Nassau County.

Indiana. J. J. Davis (June 25): The seed corn maggot severely damaged beans in Greenfield on June 8.

Michigan. R. Hutson (June 18): Infestation is very common. The pest is known as the bean maggot. The entire district of south-central Michigan, where white seed beans are raised, is infested.

North Dakota. J. A. Munro (June 21): Specimens, together with reports of moderate-to-heavy injury to corn and potatoes, have been received from points in Barnes, Sheridan, and Ward Counties.

Colorado. R. L. Wallis (June 23): Many growers have reported damage to young cucumbers in Grand Valley. In some cases it has been necessary to replant.

STALK BORER (Papaipema nebris nitela Guen.)

New Jersey. E. Kostal (June 26): One of our serious garden pests at Marganville, Monmouth County, and, together with the European corn borer, is inflicting heavy damage to sweet corn and many other plants.

GREEN STINKBUG (Nezara viridula L.)

Alabama. J. M. Robinson (June 19): The green stink bug on June 15 was reported as playing havoc with beans and peas at Ozark. Other crops were seriously damaged.

Mississippi. C. Lyle (June 24): A correspondent at Lexie sent to this office specimens collected on beans on June 9. G. L. Bond at Moss Point reports that they are more numerous and are causing more trouble than he has ever known. He states that they were found on June 12, attacking cotton, okra, watermelon, and cantaloup vines, and that an acre of corn and beans nearby had been completely destroyed by them. Mr. Bond also found them in Jackson County on June 15 injuring beans and tomatoes.

FALSE CHINCH BUG (Nysius ericae Schill.)

Utah. H. E. Dorst (June 25): Nymphs and adults are moving from maturing blister cress (Cheirinia repanda) to adjacent sugar beets and are causing severe injury to the beets that have not already been destroyed by flea beetles and beet leafhoppers in Sevier Valley.

Arizona. K. B. McKinney (June 15): False chinch bugs have been very scarce throughout the Salt River Valley this spring. Usually the nymphs become very annoying when the wild mustard dries and they begin migrating.

GARDEN CENTIPEDE (Scutigera immaculata Newp.)

Utah. G. F. Knowlton (June 17): Garden centipedes are damaging strawberry plants and apparently other young garden plants on one farm at Pleasant Grove in Utah County.

California. A. E. Michelbacher (June 21): In the delta district of the Sacramento and San Joaquin Rivers the garden centipede has caused considerable damage. In certain fields the population is building up rapidly. Two fields were surveyed on June 17 and 18 and the estimated number of garden centipedes per acre based on those actually recovered from samples was 10,000,000. A large number of the individuals recovered were first- and second-stage larvae.

POTATO AND TOMATO

VEGETABLE WEEVIL (Listroderes obliquus Klug)

California. R. E. Campbell (June 14): In an 30-acre field of tomatoes south of Chino, San Bernardino County, 100 % of the plants, just after being transplanted into the field, were attacked by vegetable weevils and caused enough damage to require 90 % replanting. This field had a cover crop of mustard on which the larvae developed in numbers. After the cover crop was plowed under and the field was planted to tomatoes the adults concentrated on the latter in large numbers.

TOBACCO STALK BORER (Trichobaris mucorea Lec.)

Arizona. C. D. Lebert (June 4): A small planting of potatoes near Phoenix was almost completely infested by this insect, known as the jimson weed borer. Ten vines were pulled at random and each stalk contained a borer.

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

Maine. G. W. Simpson (June 15): Beetles seem to have been winter killed to a large extent at Presque Isle, Aroostook County. No egg laying at this time.

Washington. R. S. Lehman (June 19): Has been more numerous than for several years. Practically all potato fields in the Walla Walla section have been sprayed or dusted. This is unusual.

Belgium. Gardeners' Chron. (London) (June 5): The progress of the Colorado beetle in Belgium appears to have been checked and every effort is being made to prevent any reappearance of this pest.

POTATO FLEA BEETLE (Epitrix cucumeris Harr.)

Maine. G. W. Simpson (June 15): Flea beetles overwintered in smaller number than usual at Presque Isle, perhaps because of less snow cover. Were found on potatoes as soon as plants came above ground. Egg laying started but is not yet at its peak.

Connecticut. N. Turner (June 22): Unusually heavy damage this spring; untreated potatoes seriously injured in southern Connecticut.

Michigan. R. Hutson (June 22): Potato flea beetles are very numerous in the vicinities of Howell and Riga.

North Dakota. J. A. Munro (June 22): Potato flea beetles abundant in potato fields near Fargo.

TOBACCO FLEA BEETLE (Epitrix parvula F.)

North Carolina. W. A. Shands (June 25): Injury by tobacco flea beetle to fully grown Irish potatoes in one field at Mount Airy was so severe that approximately 50 % of the stand was killed by June 12.

TOMATO PINWORM (Gnorimoschema lycopersicella Busck)

Arizona. C. D. Lebert (June 3): A rather heavy infestation of tomato pinworm was found by J. C. Elmore in a small plot of tomatoes northeast of Phoenix.

California. J. C. Elmore (June 4): Less than 1 percent of the tomatoes in one field near Westmoreland, Calif., were infested by the pinworm. Two other fields were free of pinworm. Examinations of several tomato fields near Indio, in the Coachella Valley, showed that pinworms were not present.

SMARTWEED BORER (Pyrausta ainslei Heinr.)

North Carolina. J. U. Gilmore (June 24): On June 12 it was observed attacking 5 % of a garden plot of tomato vines at Oxford, Granville County.

POTATO APHID (Illinoia solanifolii Ashm.)

Maine. G. W. Simpson (June 15): Owing to its relation to the spread of potato virus diseases, the abundance of this aphid on its overwintering host is of importance to the potato crop now emerging from the ground. More aphids are present on rose at this time than usual and fewer hymenopterous parasites of this aphid in evidence at Presque Isle.

Virginia. H. G. Walker and L. D. Anderson (June 24): The pink and green potato aphid is present but rather scarce in fields of tomatoes and potatoes in Norfolk and Princess Anne Counties.

POTATO LEAFHOPPER (Empoasca fabae Harr.)

Virginia. H. G. Walker and L. D. Anderson (June 24): The potato leafhopper is rather abundant in many fields of potatoes and beans near Norfolk and Suffolk and on the Eastern Shore.

BEANS

MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

Massachusetts. A. I. Bourne (June 23): Have been appearing generally in much greater abundance than last year and there is evidence that unprotected fields will suffer severely.

Connecticut. N. Turner (June 22): Damage on garden beans has been more severe than for 3 years in southern Connecticut.

New York. N. Y. State Coll. Agr. News Letter (June): Observed the first of the month in southeastern New York, and by the last of the month the beetles were generally abundant. Eggs being laid but none had hatched.

New Jersey. T. L. Guyton (June 15): Overwintering adults numerous on beans at Bound Brook.

Delaware. L. A. Stearns (June 23): Infestation light on beans.

Virginia. A. M. Woodside (June 23): Began to appear in gardens in Augusta County in considerable numbers about May 26.

H. G. Walker and L. D. Anderson (June 24): Rather scarce in all of the bean fields observed near Norfolk.

South Carolina. F. Sherman and W. C. Nettles (June 21): At Clemson the emergence from winter cages has been 50.26 percent, which is decidedly above average.

Georgia. T. L. Bissell (June 22): Found several large larvae in a short row of beans. One plot was defoliated in a garden on a stream bank at Springvale southwestern Georgia.

C. H. Alden (June 23): Heavy infestations on beans and serious damage where beans have not been properly treated at Cornelia.

Tennessee. G. M. Bentley (June): Has not been serious generally over the State until the last few days, which have brought in many inquiries for control.

Alabama. J. M. Robinson (June 19): Reported from Ozark on June 8.

Mississippi. C. Lyle (June 24): Specimens were received from Toccopola and Water Valley on June 16. L. G. Goodgame, of Aberdeen, states that he has received many complaints of injury from Monroe County.

Colorado. G. M. List (June 21): The first beetle of the season was taken in the Fort Collins district on June 12. At this time the numbers seem to be considerably below normal.

R. L. Wallis (June 23): The appearance of beetles in the fields was 2 weeks later than usual. Examinations of beetles in hibernation cages show that there will be less than 5 percent emergence in the Grand Valley

CABBAGE

IMPORTED CABBAGE WORM (Ascia rapae L.)

Connecticut. N. Turner (June 22): Appeared early but is causing little damage in southern Connecticut.

Virginia. H. G. Walker and L. D. Anderson (June 24): Has been rather abundant and has done considerable damage to untreated late spring cabbage at Norfolk. Nearly all of the early cabbage was harvested without being injured.

Ohio. T. H. Parks (June 24): Cabbage worm butterflies are common and egg laying is going on at a rapid rate.

Mississippi. L. G. Goodgame (June 24): These insects are ruining cabbage in gardens at Aberdeen.

Washington. R. S. Lehman (June 19): The cabbage butterfly has so far been abundant around Walla Walla. This is unusual.

DIAMONDBACK MOTH (Plutella maculipennis Curt.)

New York. N. Y. State Coll. Agr. News Letter (June 21): Large numbers of moths are laying eggs in cabbage seed beds in Monroe County.

Virginia. H. G. Walker and L. D. Anderson (June 24): The larvae are from rather scarce to moderately abundant on late spring cabbage at Norfolk.

Kansas. H. R. Bryson (June 2): Reported as abundant at McPherson and other localities.

Colorado. G. M. List (June 7): The second-brood moths are now appearing in large numbers. The larvae have done noticeable damage to many wild plants and to early cabbage and cauliflower. In commercial plantings the insect definitely prefers cabbage to cauliflower.

Washington. R. S. Lehman (June 19): The larvae have done considerable damage to early cabbage. This is the first heavy infestation of the diamondback moth for about 4 years at Walla Walla.

CABBAGE MAGGOT (Hylemia brassicae Bouche)

New Hampshire. J. G. Conklin (June 24): Damage is more severe than in 1936. First-generation pupae were found in Durham on June 1.

New York. N. Y. State Coll. Agr. News Letter (June 7): Causing moderate-to-severe damage in late cabbage seed beds in Wayne County. Flies are still present in rather large numbers.

Michigan. Ray Hutson (June 22): Have been observed in large numbers in southern Michigan.

CABBAGE APHID (Brevicoryne brassicae L.)

Indiana. J. J. Davis (June 25): Reported rather abundant the first of June in several localities in central Indiana.

Michigan. R. Hutson (June 22): Cabbage aphids were observed in the vicinity of Riga.

HARLEQUIN BUG (Murgantia histrionica Hahn)

Virginia. H. G. Walker and L. D. Anderson (June 24): Present but relatively scarce in fields of collards and kale kept for seed in Norfolk.

Georgia. O. I. Snapp (June 18): Seriously damaging young collard plants at Fort Valley, central Georgia.

Mississippi. C. Lyle (June 24): Causing serious injury to garden vegetables at Europa on June 2, at Magnolia on June 15. Inspectors report damage to garden vegetables at Aberdeen, Durant, and Meridian.

PEAS

PEA APHID (Illinoia pisi Kltb.)

Maine. J. H. Hawkins (June): First swept from clover on May 25 at Unity, in southern Maine, and on June 3 they were fairly abundant. A few I. solanifolii Ashm. were also observed in several fields of red clover on May 25.

Connecticut. N. Turner (June 22): Several heavy infestations have been eliminated by lady beetles, syrphids, and lace-wings. Many growers are suffering damage from root rots with pea aphid injury in southern Connecticut.

New York. N. Y. State Coll. Agr. News Letter (June 7): A heavy infestation has caused considerable damage to the pea crop. From 50 to 75 % of the plants in many fields in Nassau County have been inoculated with mosaic virus. (June 14): Practically all fields examined show some aphid infestation, ranging from 5 or 10 percent to fully 100-percent in Geneva, Ontario County.

Utah. G. F. Knowlton (June 9): Sufficiently numerous on farms 7 miles northwest of Brigham, in Boxelder County, to require control measures.

CUCUMBERS

PICKLEWORM (Diaphania nitidalis Stoll)

South Carolina. C. O. Bare (June 19): The pickleworm was found in nearly every blossom of a small planting of squash in Windermere, Charleston County, on June 19. In this locality it usually appears first the early part of July.

Florida. J. R. Watson (June 25): Some damage was done by the pickleworm and the melon worm (D. hyalinata L.) in May, but on the whole this insect does not seem to be as abundant as usual.

Mississippi. G. L. Bond (June 24): This pest has severely damaged cantaloups and cucumbers around Moss Point for the last 2 weeks.

SQUASH

SQUASH BUG (Anasa tristis Deg.)

Connecticut. R. L. Beard (June 22): Early in the season two species, A. tristis and A. armigera Say, were about equal in numbers in southern Connecticut. By June 15 A. tristis was much more abundant.

New York. N. Y. State Coll. Agr. News Letter (June 21): Eggs of squash bug are now being laid in Rockland County.

South Carolina. F. Sherman and W. C. Nettles (June 21): More complaints than usual.

Kansas. H. R. Bryson (June 26): The squash bug, aided by hot, dry weather, is causing injury to squashes and pumpkins.

Mississippi. C. Lyle (June 16): Damaging squash at Tupelo.

SQUASH BORER (Melittia satyriniiformis Hbn.)

Georgia. O. I. Snapp (June 17): The squash vine borer is damaging squash at Fort Valley, central Georgia, boring into the vines and fruit.

ONIONS

ONION THRIPS (Thrips tabaci Lind.)

Virginia. H. G. Walker and L. D. Anderson (June 24): Thrips have been very abundant on cabbage and onions at Norfolk.

Indiana. J. J. Davis (June 23): Onion thrips are doing considerable damage to recently propagated chrysanthemums in greenhouses at Lafayette.

Washington. R. S. Lehman (June 19): More numerous than usual this early in the season at Walla Walla. In some fields the onions will be much smaller on account of thrips.

ONION MAGGOT (Hylemia antiqua Meig.)

New York. N. Y. State Coll. Agr. News Letter (June 14): In western New York onion maggot flies are still prevalent in Oswego County, and onion seedlings in Wayne County have been going down this week from maggot injury.

Utah. G. F. Knowlton (June 26): Damaging onions at Salt Lake and Vineyard.

A PLANT BUG (Labopidea allii Knight)

Kansas. H. R. Bryson (June 25): The onion plant bug caused severe injury to onions in May but has now practically disappeared from the onion tops. It was reported as attacking onion in Mitchell, Marshal, and Doniphan Counties.

CARROT

CARROT BEETLE (Ligyrus gibbosus Deg.)

Iowa. C. J. Drake (June 23): Specimens have just been received from Manilla, taken in carrots. Plants were badly damaged.

CARROT RUST FLY (Psila rosae F.)

New York. N. Y. State Coll. Agr. News Letter (June 1): The first carrot rust flies emerged on May 27 and 28 in a cage located on muck north of Newark, Wayne County.

ASPARAGUS

ASPARAGUS BEETLES (Crioceris spp.)

Massachusetts. A. I. Bourne (June 23): Asparagus beetles suffered very little mortality and are more abundant than usual. Many growers, particularly in the western part of the State, found them present in such numbers that their cutting season had to be interrupted to spray.

New York. N. Y. State Coll. Agr. News Letter (June): Very numerous on Long Island the first week of the month. In western New York, in Onondago

County, the beetles were numerous the first week of the month and the last week of the month they were reported as stripping foliage in Chautauqua County.

SUGAR BEETS

BEET LEAFHOPPER (Eutettix tenellus Bak.)

Utah. H. E. Dorst (June 25): Large population of beet leafhoppers accompanied by flea beetles have retarded the growth to resistant varieties of sugar beets in Sevier County. In the Hooper district from 10 to 15 percent of the tomato plants have contracted the western yellow blight disease, transmitted by the beet leafhopper.

TORACCO

TORACCO FLEA BEETLE (Epitrix parvula F.)

Virginia. W. J. Schoene (June 24): There is an outbreak in the Piedmont section. This flea beetle injury is associated with certain diseases and the combined effect has made it very difficult to obtain a stand of tobacco plants. The injury is the most severe on record, many plants being completely consumed.

North Carolina. W. A. Shands (June 25): Severe injury by adults and larvae on newly set flue-cured tobacco occurred in June in northwestern and north-central parts of North Carolina. Loss in stands and the presence of severely injured plants were heaviest in Surry, Stokes, and Yadkin, followed by that in Forsyth and Guilford Counties. This injury was also common but less severe in Person and Granville Counties. Tentative estimates in the counties suffering the most injury place the living stand at only 50 to 70 percent, even after the tobacco fields were replanted from three to five times.

Florida. F. S. Chamberlin (June 17): Considerably more abundant than normal in the tobacco-producing district in Gadsden County.

Tennessee. G. M. Bentley (June 1937): Very abundant in the tobacco-growing counties.

L. B. Scott (June 28): Moderately abundant in western Tennessee. The infestation increased noticeably about June 20, but there are no indications at present that the insects will become more than normally abundant in Montgomery County.

POTATO FLEA BEETLE (Epitrix cucumeris Harr.)

Massachusetts and Connecticut. A. W. Morrill, Jr. (June 1): More beetles than ever at this time of year in the Connecticut River Valley. Tobacco plants attacked are riddled before setting is completed. Young potatoes badly riddled; very general. Some 20- to 30-acre tobacco fields had to be reset.

TOBACCO BUDWORM (Heliothis virescens F.)

Florida. F. S. Chamberlin (June 3): The tobacco budworm appears to be normally abundant in shaded and sun-grown tobacco fields in Gadsden County.

POTATO TUBER WORM (Gnorimoschema operculella Zell.)

North Carolina. J. U. Gilmore (June 24): First appearance of this pest was on June 14 at Oxford, Granville County. Damage slight.

CORN ROOT WEBWORM (Crambus caliginosellus Clem.)

Tennessee. J. U. Gilmore (June 24): By June 11 three or four replantings had been necessary at Mountain City in Johnson County.

TOBACCO HORNWORMS (Protoparce spp.)

South Carolina. F. Sherman and W. C. Nettles (June 21): The tobacco hornworm has been complained of from the northeastern section of the State.

Tennessee. L. B. Scott (June 14): Eggs started hatching on June 12 in Montgomery County. The infestation appears to be slightly more severe than usual.

F O R E S T A N D S H A D E - T R E E I N S E C T S

CANKERWORMS (Geometridae)

Maine. H. B. Peirson (June): The fall cankerworm (Alsophila pometaria Harr.)

and the spring cankerworm (Paleacrita vernata Pack.) are heavily infesting forest and shade trees, especially elm, in southern Maine.

S. E. Mullen (June 9): At Portland the spring cankerworm defoliated from 50 to 75 percent of the oak, elm, maple, ash, and apple trees it attacked. Some of the trees were completely defoliated. (June 15): Woodlands from Kennebunkport, north and northeast along Atlantic Highway, for several miles on both sides of the road, are defoliated from 75 to 100 percent by this cankerworm.

Vermont. H. L. Bailey (June 29): The fall cankerworm is abundant in Burlington and neighboring sections of Chittenden County. Scattered elms along the road to Saint Albans have been defoliated.

Massachusetts. A. I. Bourne (June 23): Cankerworms are more abundant in many parts of the State than last year. Serious injury to elm is again reported from Berkshire County.

W. E. Weeks (June 9): Elms in Sheffield, Berkshire County, have been damaged up to 90- percent defoliation by cankerworms.

W. W. Bancroft (June): Elms at Mill River have been completely

defoliated by the spring cankerworm.

Connecticut. B. H. Walden (June 22): The fall cankerworm is locally abundant on apple and elm in Litchfield County. A number of trees have been nearly stripped. The insect is less abundant than last year.

New Jersey. C. W. Collins and C. L. Griswold (June): Cankerworms have not been so numerous as in 1935 and 1936. The most noticeable feeding is in an area in the southern part of Morris County and the adjoining portion of Somerset County. There has also been spotted defoliation in areas in northern Somerset County.

Pennsylvania. R. M. Baker (June): Cankerworms are very abundant throughout the forested areas of the State and are prevalent in apple orchards in western Pennsylvania.

F. W. Graham (June 10): Apple trees in Carbon County are heavily infested, some being entirely defoliated by cankerworms.

Ohio. T. H. Parks (June 24): The cankerworm outbreak, which was severe in May, terminated early in June. It extended into the northeastern counties but was most injurious to elms and unsprayed apple trees in the western half of the State. The outbreak was the most severe in several years.

Indiana. J. J. Davis (June 25): The spring cankerworm has been very abundant throughout the northeastern quarter of the State. Unsprayed apple, plum, and forest trees, principally elm and ash, were severely defoliated.

Michigan. R. Hutson (June 18): Both species of cankerworm have been reported from southern Michigan.

Iowa. C. J. Drake (June 23): Several species of cankerworms are extremely abundant in the southern and eastern parts of Iowa. Many elm trees are totally defoliated.

Nebraska. N. D. Wygant (June 8): The spring cankerworm is very abundant and has completely defoliated much of both native and planted elm and hackberry in the vicinity of North Platte.

A. GEOMETRID (Physostegania pustularia Guen.)

Pennsylvania. R. M. Baker (June 24): Very abundant in the wooded areas of the State. Great clouds of moths are attracting attention, fluttering through the woods and even in cities and towns.

A. B. Champlain (June 27): Moths are swarming by the millions through the woods, especially in Dauphin and Perry Counties, woodlands and nearby flowers are covered with them. Chestnut blossoms look like spikes of white bloom.

FOREST TENT CATERPILLAR (Malacosoma disstria Hbn.)

Maine. H. B. Peirson (June 15): This insect is occurring in great abundance, completely stripping poplars in central Maine.

S. E. Mullen (June 8): Several areas of woodland in Cumberland County, southwestern Maine, are defoliated from 50 to 75 percent.

New Hampshire. J. G. Conklin (June 24): Has been very abundant throughout the State. Widespread defoliation observed in towns bordering the Connecticut River and along the eastern border of the State.

Vermont. H. L. Bailey (June 29): Causing severe or complete defoliation, particularly in sugar maple orchards over the State generally. The first cocoons were observed on June 10.

Massachusetts. A. I. Bourne (June 23): This caterpillar is again abundant. There is no evidence of any reduction in numbers from last year.

W. W. Bancroft (June 13): Defoliation is noticeable in several towns west of the Connecticut River.

C. W. Cole (June 19): Infestation of maple and oak is heavy in the Mount Toby Reservation in Franklin County, west of the Connecticut River. The population is 50 percent greater than in 1936.

Connecticut. B. H. Walden (June): This insect is occurring locally; probably less abundant than in 1936.

New York. W. E. Blauvelt (June): Abundant in many localities throughout the State, particularly in the Catskills, and has caused rather extensive defoliation of maples.

J. V. Schaffner Jr. (June 20): In Essex County, large areas of forest are defoliated, defoliation extending well up the mountain sides. The growth is largely poplar and paper birch.

Pennsylvania. W. H. Hanley (June 7): Severe defoliation of maple, ash, and linden has occurred in Wayne County, in northeastern Pennsylvania.

Michigan. R. Hutson (June 22): The forest tent caterpillar is nearly full grown in the northern part of the southern peninsula.

Minnesota. L. W. Orr (June 10): The outbreak this year in the northern and northeastern parts of the State is not so severe as in 1936, but is very great in areas where this is the first or second year of complete defoliation. The young larvae appeared from May 5 to 10, but were retarded by cool, rainy weather. They are now developing rapidly, most of them being in the fourth and fifth instars.

GREEN MAPLE WORMS (Graptolitha spp.)

Vermont. H. L. Bailey (June 29): Very abundant in swampy area at the mouth of the Lamoille River, Chittenden County, in northwestern Vermont. Soft maple, swamp oak, ash, willow, and other trees are being defoliated. G. antennata Walk. and G. laticinerea Grote are probably represented. Wide variation in the size of the larvae was noted on June 10.

GYPSY MOTH (Porthetria dispar L.)

Maine. F. H. Lathrop (June 22): Larvae are unusually abundant in woodlands in southwestern Maine. Drifting larvae caused much concern to apple growers, especially in young orchards. Carabus auratus L., predacious on the gypsy moth, occurs commonly in gardens in and near Orono. Orono is out of the area of severe gypsy moth infestation, therefore the occurrence of this carabid is interesting.

H. B. Peirson (June 1): Heavy infestation is occurring in southern Maine.

A. F. Burgess (May): Egg clusters started to hatch in the Bangor district the middle of May. The first hatching at Portland was noted on May 16 and by the 18th larvae were leaving the egg clusters.

New Hampshire. A. F. Burgess (May): Hatching at Quincy, Grafton County, where the first hatch was noted on May 14.

Massachusetts. A. I. Bourne (June 23): Causing extensive and serious defoliation in many sections of the State. Reports were received late in May from the eastern part of the State that the larvae were appearing in large numbers and beginning to cause serious stripping. It was reported from Bristol County, in the southeastern part of the State, as causing considerable damage to newly set fruit of peach.

A. F. Burgess (May): The earliest observations of hatching of gypsy moth eggs were made at Billerica on May 5. The initial hatching at Ipswich was noted on May 10, and hatching was rather general in the Cape Cod section by May 12. Larval hatch has been reported as very heavy in the Middleboro district.

SATIN MOTH (Stilpnotia salicis L.)

Maine. H. B. Peirson (June 15): Very abundant on poplars in central and southern Maine. Besides stripping trees the larvae causing complaints by crawling into houses.

Connecticut. P. A. Stanley (June 7): Willow and poplar in Bridgeport and Stratford are noticeably defoliated.

BAGWORM (Thyridopteryx ephemeraeformis Haw.)

District of Columbia. J. A. Hyslop (June 30): Numerous calls are being received for methods of control on evergreens.

- Tennessee. G. M. Bentley (June): Less abundant than it was last year.
- Mississippi. C. Lyle (June 10): Collected on cedar at Picayune and junipers at Hattiesburg.
- Texas. F. L. Thomas (June 22): This insect is abundant and is causing injury to arborvitae at College Station on June 15. On June 19 it was reported as causing injury in Wharton County in southern Texas.

ELM

ELM LEAF BEETLE (Galerucella xanthomelaena Schr.)

- Massachusetts. E. P. Felt (June 23): Eggs have been reported as unusually abundant in the Pittsfield district.
- Maryland. E. N. Cory (May 27): Adults collected at Ellicott City.
- Ohio. T. H. Parks (June 24): The first generation of larvae began hatching early this month and have already severely injured English elms in some parts of Columbus. American elms have not been injured.
- Indiana. J. J. Davis (June 26): Full-grown larvae and pupae are very abundant in the Clarke County State Forest, and only a few small larvae and no adults are being observed. The European elm is severely attacked, whereas the Chinese elm is somewhat less extensively damaged and the American elm only slightly damaged.
- Kentucky. W. A. Price (June 1): Eggs are hatching at Lexington.
- Idaho. F. Shreck (June 15): This insect has not been seen this year, although for a number of years it has been a major pest of elms in southwestern Idaho.
- California. M. S. Morley (June 7): Showing some damage on elms in Kern County.

WOOLLY APPLE APHID (Eriosoma lanigerum Hausm.)

- Indiana. J. J. Davis (June 25): The elm leaf curl aphid has been abundant in the northern half of the State.
- Iowa. C. J. Darke (June 23): Extremely abundant on elm trees throughout most of Iowa.
- Missouri. L. Haseman (June 23): Has attracted considerable attention on elms.
- Kansas. H. R. Bryson (June 26): Reported as abundant in scattering localities in the northeastern and northwestern parts of the State.

EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

- New Jersey. J. C. Silver (June 5): An exceedingly heavy infestation on elm in a park at Orange.

Ohio. E. Mendenhall (June 5): Very abundant on elms in towns and cities in central Ohio.

Indiana. J. J. Davis (June 25): Reported abundant on elm in several localities in the northern half of the State.

Michigan. E. I. McDaniel (June 22): This scale is becoming prevalent. Specimens have been received from Battle Creek, Lansing, and Standish. Most of the injury is on small trees growing in ornamental plantings.

FIR

AN APHID (Dreyfusia piceae Ratz.)

New Jersey. H. J. MacAloney (May): Light infestations were discovered at Somerville and Far Hills on an exotic fir, Abies firma.

LARCH

LARCH CASEBEARER (Coleophora laricella Hbn.)

New England and New York. J. V. Schaffner Jr. (June 25): In New England and northern New York this insect continues as a serious menace to larch. Throughout the Adirondack section of New York larches show severe browning. In New England the severely browned areas of larch are more or less local, but some injury can be found in practically every stand. Most of the moths issued between June 5 and 14.

Massachusetts. A. I. Bourne (June 23): Very abundant generally and is causing damage in Berkshire County, particularly around Richmond.

Connecticut. B. H. Walden (June): The foliage of many trees in Litchfield County has been browned by this insect.

New York. E. P. Felt (June 22): The larch casebearer has been generally abundant and injurious throughout southeastern New York.

LINDEN

LINDEN BORER (Saperda vestita Say)

New York. E. P. Felt (June 23): The linden borer has been quite injurious to several large lindens, having a trunk diameter of 2 feet or more, at Great Neck, Long Island. The trees have been badly damaged at the base, in one or two instances almost completely girdled. One borer was found working several inches below the surface of the soil.

MAPLE

COTTONY MAPLE SCALE (Pulvinaria vitis L.)

Indiana. J. J. Davis (June 25): Has been reported from a number of localities in the northern half of the State.

Illinois. C. L. Metcalf (June 22): Judging from the correspondence, the scale is unusually abundant in the northern part of Illinois.

Michigan. E. I. McDaniel (June 22): Has been reported on maple at Flint and gooseberry at Paw Paw. The egg masses were fully developed on June 11, and some of the eggs had started hatching.

MESQUITE

AN UNDERWING (Melipotis nigrescens G. & R.)

Arizona. C. D. Lebert (June 23): The insect reported on page 197 of the Insect Pest Survey Bulletin dated June 1, 1937, has now been identified as the above species.

PINE

EUROPEAN PINE SHOOT MOTH (Rhyacionia buoliana Schiff.)

New York and New England. E. P. Felt (June 22): This moth is becoming locally abundant and injurious in southwestern New England and southeastern New York.

Ohio. A. D. Taylor (June 23): Specimens collected from mugho pine in Cleveland. (Det. by C. Heinrich.)

A PYRALID (Tetralopha melanogrammos Zell.)

New Jersey. F. A. Soraci (June 24): A light infestation on white pine at Ramsey, Bergen County, and at Summit, Union County. Larvae appear to be full grown.

A PINE ENGRAVER (Ips oregoni Eich.)

Montana. J. C. Evenden (June 18): A severe infestation on ponderosa pine in the Rocky Boy Indian Reservation. Groups of trees, ranging from reproduction to mature trees, were killed during the last year.

A SAWFLY (Neodiprion sp.)

Massachusetts. J. V. Schaffner Jr. (June 25): Outbreaks occurred in many red pine plantations in Middlesex and Worcester Counties and in at least one natural stand of red pine. Larvae were full grown and spinning cocoons on June 12.

SPRUCE

EASTERN SPRUCE BEETLE (Dendroctonus piceaperda Hovk.)

Vermont. J. V. Schaffner Jr. (June 19): In the Green Mountain National Forest near Rochester, large areas of overmature spruce are seriously infested. Most adults had issued from hibernation and are making new galleries.

and laying eggs. A few overwintered larvae are transforming to beetles. New pitch tubes and borings were very noticeable, particularly on the slopes.

A SAWFLY (Pachynematus sp.)

Maine. H. B. Peirson (June 1): Larvae are very abundant in places in Kennebec County feeding especially on new foliage, and later on old foliage. The insect is found especially on young growth. Ovipositing from May 28 to June 6.

EUROPEAN SPRUCE SAWFLY (Diprion polytomum Htg.)

Connecticut. H. J. MacAloney (May): Observations made during May at Orange indicate a marked reduction in infestation from that of 1936.

New Jersey. H. J. MacAloney (May): On May 18 and 19 first instar larvae were taken at Far Hills and Somerville. This is believed to be the first record of this sawfly in New Jersey. The infestation was light at both places.

SPRUCE NEEDLE MINER (Taniva albolineana Kearf.)

Pennsylvania. R. M. Baker (June): Spruce leaf miners are numerous in Allegheny, Butler, and Westmoreland Counties.

Idaho. H. J. Rust (June 11): Adults reared from infested spruce on the Kaniksu National Forest, in Boundary County, have been identified as the above species. This is the first record of this insect in this forest.

WILLOW

EUROPEAN WILLOW LEAF BEETLE (Plagioderma versicolora Laich.)

Vermont. H. L. Bailey (June 29): Very abundant on willow in Charlotte, Ferrisburg, and other Champlain Valley towns of Chittenden and Addison Counties. A large part of the foliage was skeletonized on June 18.

New York. B. F. Makér (June 25): About 70 willows at North Roslyn heavily infested.

New Jersey. C. W. Collins (June 22): Causing noticeable injury to foliage of willow on streets of Livingston, Pluckemin, and Somerville.

MOURNING-CLOAK BUTTERFLY (Hamadryas antiopa L.)

Maryland. E. N. Cory (May 26): A heavy infestation is occurring on willow at Riverdale.

Indiana. J. J. Davis (June 25): This caterpillar was reported as defoliating willow at Auburn and LaFayette early in June.

Iowa. H. E. Jaques (June 23): This caterpillar is again defoliating willow and elm in Dickinson County.

COTTON INSECTS

BOLL WEEVIL (Anthonomus grandis Boh.)

South Carolina. F. Sherman and W. C. Nettles (June 21): Early season abundance is much higher than usual. Emergence in hibernation cages at Clemson has averaged 8.75.

South Carolina. F. F. Bondy and C. F. Rainwater (June 5): In Florence County weevils are numerous in fields near the woods. (June 19): Practically every field has some boll weevils. Although several moppings have been made, some fields still contain enough weevils to do damage. (June 26): Weevils are still emerging from hibernation. Nearly twice as many emerged from the hibernation cages during June 1937 as in any June during the last 6 years. In some of the fields 25 percent of the squares are infested.

Florida. H. C. Young, J. T. Roy, and K. H. Smith (June 19): In Alachua County in 14 fields of Sea Island cotton that had been treated, square infestation ranged from 0 to 31 percent, averaging 8.4 percent. In seven untreated fields the square infestation ranged from 2.2 to 23.7 percent, averaging 8.7 percent. (June 26): The infestation in the same fields was slightly less than during the previous week.

Georgia. P. M. Gilmer, P. A. Glick, W. L. Lowry, and K. P. Conradi (May 29): Weevil infestation throughout southern and eastern Georgia is probably the lightest in the history of the weevil. (June 19): In most of the fields the infestation does not exceed 5 percent.

Mississippi. C. Lyle (June 24): Reports from various parts of the State indicate that the infestation is considerably higher than it was at the same date last year, the average infestation being $7\frac{1}{2}$ percent, as compared with 2 percent last year.

E. W. Dunnam and J. C. Clark (June 12): Infestation in Washington County is lighter than last season and about equal to that of 1935.

G. D. Green and K. E. McCoy (June 26): Square infestation in three fields examined in Oktibbeha County averaged 15 percent, as compared to 0.7 percent on same date in 1936, 19 percent 1935, and 9 percent in 1934.

Louisiana. C. O. Eddy (June 25): Infestation around Baton Rouge is increasing. The highest infestation is 9 percent. Control operations have started in central Louisiana.

R. C. Gaines and assistants (June 26): At Tallulah total emergence in hibernation cage to date is about 12 percent, as compared with 18 percent in 1932 and .10 percent in 1935 and .17 percent in 1936. Square infestation ranged from 0 to 8.5 percent, averaging 2.0 percent in untreated field plots.

Oklahoma. F. A. Fenton (June 21): In McCurtain and Choctaw Counties, in south-eastern Oklahoma, the infestation is serious, averaging over 10 percent.

Texas. R. W. Moreland and A. B. Beavers (June 19): The emergence from the hibernation cages at College Station is 6.3 percent to date. In 1936 the emergence was 2.4 percent and was completed by June 20. The square infestation in upland fields ranged from 11 to 51 percent. The high infestation is due to the fact that few squares were formed, because of previous thrips injury.

Texas. K. P. Ewing, R. L. McGarr, et al. (June 12): In the Lavaca River bottom of Jackson County the average weevil infestation was 25 percent. Boll weevil infestation is higher this year at this time in Calhoun County than at the same time in the past 5 years. (June 26): There was considerable increase in weevil infestation in Calhoun County and, in general, the infestation this year is higher than during any recent year. There was also an increase in infestation in Jackson County and in some fields practically 100 percent of the squares are punctured.

COTTON FLEA HOPPER (Psallus seriatus Reut.)

South Carolina. F. F. Bondy and C. F. Rainwater (June 26): A few have been found in Florence County but no damage was caused.

Georgia. P. M. Gilmer, P. A. Glick, W. L. Lowry, and K. P. Conradi (June 19): Hoppers are present in all fields in southern Georgia but the damage is comparatively small.

Mississippi. C. Lyle (June 24): Flea hopper has been observed on cotton in scattered localities, but the damage is not serious.

G. D. Green and K. E. McCoy (June 12): In Oktibbeha County hopper are more numerous than during the last 3 years. (June 19): The hoppers are decreasing.

Louisiana. R. O. Gaines and assistants. (June 26): In Madison Parish a total of 31 flea hoppers were found on 14 plantations after 2,200 sweeps. No damage is being caused.

Texas. F. L. Thomas (June 26): Damage by cotton flea hoppers is attracting more attention and is more widespread than the damage caused by the boll weevil. In central Texas adults have produced an increase in the nymph population of 70 to 100 percent during the last week. The infestation is heavier in bottomland fields. None of the upland fields examined in the sandy post area had sufficient infestation to justify control measures.

R. W. Moreland, A. B. Beavers, and H. T. Vanderford (June 19): In upland cotton in Burleson and Brazos Counties an average of 2.8 hoppers per 100 terminal buds was found.

K. P. Ewing, R. L. McGarr, et al. (June 26): In Calhoun County an average of 104 flea hoppers per 100 terminal buds was found. This is an increase

of 41 percent over the previous week in flea hopper population. Damage was caused in many fields.

RAPID PLANT BUG (Adelphocoris rapidus Say)

Florida. H. C. Young, J. T. Roy, and K. H. Smith (June 26): In Alachua County A. rapidus has been found to be present in all cotton fields examined and in sufficient numbers to be causing considerable damage in some fields.

Mississippi. G. L. Bond (June 24): This plant bug was collected from cotton at Lucedale, southeastern Mississippi, on June 12.

Louisiana. R. C. Gaines and assistants (June 26): In 2,200 sweeps on 14 plantations in Madison Parish 28 adults and 20 nymphs were found.

BEE T ARMYWORM (Laphygma frugiperda S. & A.)

General. T. P. Cassidy and T. C. Barber (May): This insect has again caused considerable damage to cotton in Arizona. This is the third year in succession that seedling cotton has been damaged and it appears that it is becoming an important local pest. The most extensive outbreak and severe injury occurred in 1935 in the main cotton sections of Arizona, and in the irrigated sections of New Mexico and west Texas. The present outbreak ranks between that of 1935 and 1936, the damage being greater than 1936 but considerably less than in 1935. While the insects were generally distributed over the Salt River and Yuma Valleys this year they were most abundant in the Buckeye area.

COTTON LEAF WORM (Alabama argillacea Hbn.)

Texas. K. P. Ewing, R. L. McGarr, et al. (June 5): The first appearance in southern Texas this year was about 2 weeks later than last year. (June 9): First leaf worms were found near Port Lavaca, Calhoun County. (June 19): Found in many fields in Calhoun County but no serious infestation or damage was caused. Worms were reported on this date from Jim Wells County.

THRIPS (Thysanoptera)

South Carolina. F. Sherman and W. E. Nettles (June 21): Considerable damage has been done to young cotton. A month ago damage was chiefly toward the coast, but now it is chiefly in the Piedmont. Injury is being outgrown.

F. F. Bondy and C. F. Rainwater (June 5): Thrips are numerous in Florence County and are doing some damage. (June 26): Thrips have just about left the cotton.

Mississippi. E. W. Dunnam and J. C. Clark (June 5): In Washington County thrips are causing some damage to cotton in almost all fields, but the damage is not as pronounced as it was last season.

G. D. Green (June 19): In Oktibbeha County considerable damage has been caused but plants are recovering.

Louisiana. S. S. Sharp (June 25): Echinothrips americanus Morg. occurred in destructive numbers in late spring cotton and soybeans in the insectary at Baton Rouge. This thrips first appeared in the insectary last summer and has confined its attack to the two hosts mentioned. It has not been found out of doors, even in the surrounding fields.

Texas. F. L. Thomas (June 5): Dry weather prevails in part of central Texas and thrips injury is severe in most fields, especially on the heavy soils.

Texas. R. W. Moreland, A. B. Beavers (June 19): Because of thrips damage a large number of the cotton plants examined in Burlison and Brazos Counties contained no squares.

INSECTS AFFECTING GREENHOUSE AND ORNAMENTAL PLANTS

EIGHT-SPOTTED FORESTER (Alypia octomaculata F.)

Kansas. H. R. Bryson (June 23): The largest population of moths that has been seen for several years was observed this spring. The larvae are injuring Virginia creeper, wild grape, and cultivated grape in northeastern Kansas.

COTTONY-CUSHION SCALE (Icerya purchasi Mask.)

Arizona. C. D. Lebert (June 10): A heavy infestation was found on Pittosporum tobira, which is common in Phoenix. This planting has been clean since 1933. There are no Vedalias present.

GLADIOLUS

GLADIOLUS THRIPS (Taeniothrips simplex Morison)

Florida. J. R. Watson (June 25): A heavy infestation of this thrips developed in Manatee County late in May.

IRIS

IRIS BORER (Macronoctua omista Grote)

Ohio. E. W. Mendenhall (June 28): The iris borer is abundant in old plantings of iris throughout the State.

JUNIPER

A PYRALID (Herculia intermedialis Walk.)

New York. R. D. Glasgow (June 23): Young junipers near Poughkeepsie have been severely damaged by these caterpillars. This is the first record of the occurrence of this insect on juniper, so far as we know.

LARKSPUR

CYCLAMEN MITE (Tarsonemus pallidus Banks)

Connecticut. W. E. Britton (June 23): Shoots of larkspur with the leaves curled by this mite have been received from Middlebury and Woodbury, and two lots from Hamden.

MUGHO PINE

INTRODUCED PINE SAWFLY (Diprion simile Htg.)

Michigan. E. I. McDaniel (June 22): Has appeared in unusual numbers throughout the eastern part of the State and is causing serious injury to mugho pine in nurseries and ornamental plantings.

PHLOX

PHLOX PLANT BUG (Lopidea davisii Knight)

Maryland. E. N. Cory (June 22): Doing considerable damage to phlox at College Park.

RHODODENDRON

RHODODENDRON LACEBUG (Stephanitis rhododendri Horv.)

New York. R. E. Horsey (June 22): Wingless young are numerous and feeding on old leaves of rhododendron at Rochester.

ROSE

ROSE SAWFLY (Caliroa aethiops F.)

New Jersey. J. C. Silver (June 5): Causing severe damage in Essex County.

Indiana. J. J. Davis (June 25): Has been rather abundant throughout the State since June 1.

Kansas. H. R. Bryson (June 23): Larvae caused considerable injury to rose late in June, but as a whole the insect is less abundant than in some years.

YEW

BLACK VINE WEEVIL (Brachyrhinus sulcatus F.)

Connecticut. J. P. Johnson (June 10): Abundant in a localized area in Greenwich, attacking the roots of Taxus cuspidata. A few plants died and others are in poor condition.

INSECTS ATTACKING MAN AND
DOMESTIC ANIMALS

MAN

SAND FLIES (Culicoides spp.)

Maine. H. B. Peirson (June 11): Punkies, or no-se-ums, are appearing in great numbers in the vicinity of Augusta.

Georgia. J. B. Hull (May): The number of sandflies near the marshes at Savannah has gradually decreased during the month. The emergence of V. canithorax Hoff. is almost over, and C. dovei Hall is beginning to emerge.

Florida. J. B. Hull (May): During the latter part of May, particularly since May 24, several complaints have been received from residents along the Indian River, the downtown district of Indian River City, and from Moravilla. Residents of Fort Pierce state that sand flies were worse than at any other time, except in July 1936.

AMERICAN DOG TICK (Dermacentor variabilis Say)

Washington, D. C. F. C. Bishopp (June 24): The American dog tick has become generally abundant over the eastern part of the country. A few cases of Rocky Mountain spotted fever undoubtedly transmitted by this tick have occurred in this vicinity recently.

BLACK WIDOW SPIDER (Lactrodectus mactans F.)

North Dakota. J. A. Munro (June 21): A female spider was captured in a house in Nelson County. This is apparently the first record of the occurrence of this spider in the northeastern section of the State.

CATTLE

SCREWORM (Cochliomyia americana C. & P.)

United States. W. E. Dove (June 30): For the 4-week period ended June 18, 4,219 infestations of screwworms were reported from the peninsular section of Florida, among 432,390 animals. In the southeastern counties of Georgia 134 cases were reported, among 31,371 animals. In the southwestern States 82 cases were reported in the river valleys of southern Arizona, and 1,009 cases were reported from the southeastern section of New Mexico. In Texas 8,072 cases were reported from almost two and one-half million animals. The distribution extended from the coast as far north as Wichita Falls and Lubbock. Small numbers of cases occurred throughout the western half of the State. The highest incidence occurred among sheep in Val Verde, Pecos, Sutton, and adjoining counties, where 1,263 cases were reported in the mouths of animals following the eating of prickly pear (cactus). In Florida and Texas more cases resulted in the navels of newly born animals than from any other cause. In Florida there were 2,611 and in Texas 3,140 such infestations.

HORN FLY (Haematobia irritans L.)

Missouri. L. Haseman (June 23): Since the middle of June there has been a very serious outbreak in central Missouri. Animals are covered with flies in many instances.

Texas. E. W. Laake (June 17): Eighty head of cattle at a dairy near Dallas averaged at least 50 horn flies per animal. One animal carried an infestation of approximately 2,000 flies.

STABLEFLY (Stomoxys calcitrans L.)

Missouri. L. Haseman (June 23): There has been a serious outbreak in central Missouri since the middle of June.

Kansas. H. R. Bryson (June 26): This insect is abundant, even annoying human beings.

HORSES

DEER FLIES (Chrysops spp.)

Delaware. L. A. Stearns (June): C. plangens Wied. reported as abundant and annoying in New Castle County on May 31, and C. flavidus Wied. and C. callidus O. S. were abundant and annoying on June 7.

Utah. G. F. K_nowlton (June 9): C. discalis Will. is abundant and annoying to livestock and man in the meadows in Boxelder County. . .

WINTER TICK (Dermacentor albipictus Pack.)

North Dakota. J. A. Munro (June 22): A few stockmen in the southwestern part of the State reported that ticks are attacking horses. This tick is reported to have caused the death of an elk in Richland County. The veterinarian stated that the ticks were so abundant on the dead animal that it was practically impossible to place a finger on its body without touching one or more ticks.

HOUSEHOLD AND STORED-PRODUCTS INSECTS

AN ANT (Wasmannia auropunctata Roger)

Florida. W. V. King (May 4): Found entering houses and causing annoyance in Orlando. (Det. by R. A. Cushman.)

AN ANOBIID (Platybregmus canadensis Fisher)

New York. R. W. Leiby (June 17): Reported as making basswood floors of a house at Cameron Mills, Steuben County, like a sponge by its feeding. On some days as many as half a teacup full of beetles were swept up. (Det. by W. S. Fisher.)

THE MORE IMPORTANT RECORDS FOR JULY

Grasshoppers continued to be the most serious problem of the year. Rather heavy migrations were under way over much of the infested area. In the southern part of this area--Nebraska and Colorado--the outbreak was probably as heavy and widespread as the outbreaks in the late 70's.

A slight outbreak of Mormon crickets occasioned considerable alarm in the Dakotas during the month. In the western part of the range of this insect egg laying began the second week of July.

The Japanese beetle was appearing in unprecedented numbers. Around the periphery of the infested area reports of heavy emergence have been received from the metropolitan area surrounding New York City, and from Connecticut, Rhode Island, Delaware, and northeastern Maryland.

The recently introduced weevil Naupactus leucoloma Boh. reached its peak of emergence the second week of July. In some fields in Florida it was emerging at the rate of about 500,000 beetles per acre. The insect was discovered at Laurel, Missi., on August 9.

Another weevil but recently reported from this country, Calomycterus setarius Roelofs, again appeared in numbers in parts of Connecticut.

A heavy outbreak of the variegated cutworm occurred in Wisconsin, Minnesota, Nebraska, and South Dakota. In many places the outbreaks were unprecedented.

Unusual numbers of the sugar beet webworm were reported from North Dakota and the Great Basin States.

The white-lined sphinx appeared in startling numbers over a very wide area extending from Michigan westward to the Dakotas and Idaho.

Serious armyworm outbreaks occurred over much of the United States, reports having been received from the New England, Middle Atlantic, East Central, West Central, and Great Basin States.

The European corn borer was much more destructive than last year in the New England States and New York.

Codling moth abundance was variable, New Jersey reporting the heaviest infestation since 1933 and Delaware the lowest since 1929. In general, infestations appear to be about normal.

The flatheaded apple tree borer is still destructive over much of the area that has suffered severe drought during the last few years.

Blister beetle injury was reported generally from New England to Kansas and the Gulf.

Serious damage to tomato fruit from the corn ear worm was reported from the Middle Atlantic and East Central States. The usual damage to sweet corn is being generally reported. The infestation in southern California is apparently increasing.

Unusual injury to potatoes by leafhopper was reported from the Middle Atlantic States and from some parts of Indiana and North Dakota.

From New York westward to South Dakota the imported cabbage worm was generally destructive.

False chinch bug attacking sugar beets is reported from Idaho south to Arizona and east to Oklahoma and Texas.

The boll weevil is causing more damage in South Carolina than it has in a number of years. Infestation is also quite heavy in northern Georgia. In the Gulf region, although populations are not unusually high, weather favorable for weevil development has increased the hazard. Heavy infestations are also reported from eastern and southeastern Texas.

Cotton flea hopper damage was reported from northern Georgia westward to southern Texas.

A half-grown cotton leaf worm was found on July 22 in southern Georgia and one on July 13 in southern Alabama. Up to August 2, however, no leaf worm had been reported from Louisiana or Mississippi.

Gypsy moth infestation in New England is heavier than it has been for many years and very serious defoliation is generally reported.

Severe defoliation by the forest tent caterpillar is also reported from New England and Minnesota.

Cankerworms are generally reported from New England, and the most serious outbreak of the spring cankerworm ever to be reported is under way in Nebraska.

The bagworm is generally prevalent from New England and the East Central States southward to the Gulf.

A heavy infestation of the spruce budworm on ponderosa pine is reported from Colorado.

THE MORE IMPORTANT ENTOMOLOGICAL FEATURES IN CANADA

In areas in Saskatchewan where crop conditions have been poor, and control measures consequently generally neglected, grasshopper ravages were completing the work of the drought. Local dispersal of the insects resulted in severe defoliation of remaining crops throughout west-central and northwestern parts of the Province, with heavy reduction in feed supply for livestock. Infestations are spreading north and north-eastward into many new districts. In Alberta there was little loss from grasshoppers up to the end of June and the use of poisoned bait was proceeding with satisfactory results. However, with the advent of hot weather in July, the grasshoppers were migrating into grain fields, and some districts reported losses in spite of the strenuous poisoning campaign. Toward the middle of July hoppers were migrating into southern Alberta and losses were increasing in drier sections, particularly in the southeast. Severe damage was still occurring in southern sections, in the latter part of the month, in spite of recent rains. In Manitoba the distribution of poisoned bait was necessary only in the extreme southwest, and excellent kills were obtained. Late in July, grasshoppers in the Red River Valley were reported dying of fungous disease. By mid-July, a large proportion of the grasshoppers over extensive areas of the Prairie Provinces had reached the adult stage.

In areas of Saskatchewan and Alberta affected by extreme drought, the destruction of host plants may result in a marked reduction of the wheat stem sawfly population, and reduce the economic importance of the insect in such areas for some time to come. In the Rockyford, Nobleford, and Barons districts of Alberta, wheat is severely infested.

The armyworm is causing considerable loss of excellent stands of oats, other grains, and grasses in a wide area in eastern Saskatchewan and has defoliated some fields of oats and barley at scattered points in Manitoba.

Severe outbreaks of the western chinch bug occurred in old brome-grass pastures in the Red River Valley, Manitoba and, where the insects attacked wheat in numbers, completely destroyed the crop.

Weather conditions in southwestern Ontario were ideal for pupation and emergence of the European corn borer. The first moths and eggs were found at Chatham on June 28.

Extensive outbreaks of blister beetles of several species again occurred in the Prairie Provinces. The abundance of these insects is reported to be associated with repeated outbreaks of grasshoppers, on the crops of which the larvae feed.

The Colorado potato beetle appears to be more abundant and injurious than usual in Ontario and parts of Quebec. A marked reduction over previous years is noted in Manitoba.

Heavy infestations of flea beetles of several species were reported on field and garden crops in various parts of Eastern Canada and in Manitoba.

Important damage by the cabbage maggot was reported in Ontario and on Prince Edward Island. In the latter Province and in eastern Ontario the onion maggot is also causing notable injury.

Extensive flights of the diamondback moth occurred in southern Alberta and Saskatchewan in spring, and the larvae have caused rather severe damage to cruciferous crops.

The first brood of codling moth was heavy in southern Ontario, as a result of the large carry-over from 1936. There were no serious worm infestations, however, in well-sprayed orchards.

The infestation of oriental fruit moth continues very low in peach orchards of southern Ontario.

The apple aphid and the black cherry aphid are troublesome in orchards of the Okanagan Valley, British Columbia.

An infestation of the spruce budworm is present over a large territory in Manitoba and Ontario. It apparently extends from the Sandilands Forest Reserve, Manitoba, to the Eagle River, Ontario, and appears to be spreading westward.

The spruce mite, which has long been a serious pest of planted spruce in the Prairie Provinces, has this year assumed outbreak proportions, and reports indicate that defoliation is proceeding rapidly.

An extensive and injurious infestation of the yellow-headed spruce sawfly has developed in northern and central Manitoba, Saskatchewan, and Alberta.

The European pine shoot moth, which was largely eliminated in the Niagara district, Ontario, by the severe winter of 1933-34, has recovered and increased to a somewhat alarming extent.

Severe defoliation by the satin moth is reported on Prince Edward Island and Cape Breton Island. Defoliation also occurred at Moncton and in Westmoreland County, New Brunswick. A new infestation was discovered at McAdam, New Brunswick. Little damage was done this year at Amherst, Nova Scotia, where the outbreak has been much reduced.

GENERAL FEEDERS

GRASSHOPPERS (Acrididae)

- Vermont. H. L. Bailey (July 26): The lesser migratory grasshopper (Melanoplus atlantis Riley) is abundant in West River Valley, Windham County, southeastern Vermont.
- Georgia. O. I. Snapp (July 1): Grasshoppers originating in wheat stubble have moved to adjoining cotton and corn and have caused considerable damage to those crops at Marshallville, in central Georgia. (July 13): Grasshoppers are unusually abundant and have caused considerable damage to old corn at Fort Valley.
- C. H. Alden (July 19): Severe damage to corn by grasshoppers. Most abundant species were M. differentialis Thos. and Dissostertia carolina L. Grasshoppers are generally more abundant and injurious in the southern half of the State than they have been in many years.
- Florida. J. R. Watson (July 23): Grasshoppers, particularly the so-called "bird grasshopper" (Schistocerca americana Drury), did much damage in the northern part of Alachua County, where corn was badly riddled over a considerable section.
- Ohio. T. H. Parks (July 22): But one report has reached this office concerning grasshopper damage. This came from Brown County, southern Ohio, where the insects were reported injuring tobacco and soybeans on a farm. During the wheat-insect survey grasshoppers were found to be present in only moderate numbers.
- Indiana. J. J. Davis (July 26): Grasshoppers are abundant in more or less isolated spots throughout the northern half of the State, with greatest prevalence in the western part, especially near the Illinois State line. Although most of the trouble is in the field crops, a number of reports of injury in gardens were received the first half of the month.
- Illinois. W. P. Flint (July 21): Grasshopper damage continues to be moderate over much of the infested area in the State. There is considerable migration to corn and soybeans, now that the small grain is being cut. Hoppers in all cases are showing distinct preference for soybeans over corn.
- Minnesota. A. G. Ruggles (July 19): Grasshoppers being reported from all southern and western counties of the State. Not alarming, but unless controlled will build up.
- Missouri. L. Haseman (July 24): The infestation in Missouri continues to be serious. Some second-brood emergence, apparently of Melanoplus mexicanus Sauss.

North Dakota. F. G. Butcher (July 19): Grasshoppers continue to be the most important insects in all counties, except in the northeast corner of the State, with M. mexicanus the predominant form. Most of the important species are in the adult stage. Localized migrations have been commonly reported during the last 2 weeks over most of the infested area but the hoppers have not spread out extensively into noninfested areas. Control operations are slowing down considerably in some areas, since farmers are becoming discouraged because of the continued invasion by adult flights. M. bivittatus Say, M. packardii Scudd., M. mexicanus, and M. femur-rubrum Deg. have been observed mating and M. bivittatus has started laying eggs.

South Dakota. H. C. Severin (July 2): Many grasshoppers are now fully winged. Considerable migration is taking place. Hordes of grasshoppers are moving into South Dakota from the south and many are leaving the State for regions elsewhere. Owing to harvest, the poisoning campaign has lagged. (July 3): M. mexicanus is the species most harmful in South Dakota. Of considerable less importance are M. differentialis and M. bivittatus. A very serious infestation covers much of eastern South Dakota, east of the Missouri River. Much less serious west of the Missouri, but become more abundant near the Black Hills. Considerable damage has already been done to small grain, corn, and garden crops.

Nebraska. O. S. Bare (May 20 to July 20): Grasshoppers proved to be the outstandingly major pest in the State during the period here covered. The grasshopper infestation is unquestionably the heaviest and most widespread since the pioneer "grasshopper years" of 1874-76. Every county in the State has experienced serious crop damage, with the possible exception of five or six counties in the sandhill area, and more or less scattered but somewhat destructive infestations have occurred there. M. bivittatus and M. mexicanus had hatched in large numbers by May 20, and hatching of those species continued into the early part of June. M. differentialis had barely started to hatch on May 20, but developed rapidly and continued well through June. The first noticeable crop damage was reported about May 20, and became increasingly heavy throughout the 2-month period. Spring seedings of alfalfa and clovers were badly damaged or destroyed, and spring-planted grains and older alfalfa and clover fields in many sections were badly stripped. Serious damage to corn began early in June and has continued to the close of the period covered by this report.

M. H. Swenk (July 20): Parasites of grasshoppers have begun to appear in force. The amount of parasitization by the sarcophagid fly Sarcophaga kellyi Ald. had by July 20 become quite large. Dead M. bivittatus, M. differentialis, M. femur-rubrum, and M. mexicanus, collected from two farms near Lincoln from June 25 to July 1, began giving up maggots of this species within 24 hours. Of the 691 grasshoppers collected on one farm, a total of 125 sarcophagid maggots

emerged and 103 pupated and successfully reached the adult-fly stage, giving a total successful parasitization of 18 percent. Even heavier parasitization has been reported from western Nebraska, especially in Garden County, where the toll of Sarcophaga kellyi on the grasshopper population has become obvious on some farms. Parasitization of grasshoppers by S. kellyi was first reported from Hall County on June 22. A great abundance of the mite Eutrombidium trigonum has also developed on Nebraska grasshoppers. The first reports of the presence of these mites in abundance came from Jefferson, Boone, and Dodge Counties on June 25, 26, and 30, respectively, and reports have since become general over the State. Since the end of June, and especially during July, there have been reports of heavy infestation of grasshoppers, especially of M. bivittatus and M. differentialis with hairworms (Gordiaceae). These have come from Richardson County north to Douglas and Madison Counties and west to Furnas County.

Kansas. H. R. Bryson (July 22): Although grasshoppers are abundant in most sections of the State, the situation is not alarming and not as bad as last year. In some localities parasitization is playing an important role in the natural control. The most common parasites are the dipterous ones and the horsehair snake (Mermis sp.). In northeastern Kansas 50 percent parasitization has been observed in some localities, but the number of reports received by correspondence have been comparatively few. This is no doubt due to the effective organized control campaigns that have been instituted in the counties. Such campaigns are usually accompanied by the distribution of information that would ordinarily be sent out in correspondence. Most of the species involved at present are Melanoplus bivittatus, M. mexicanus, M. differentialis, and M. femur-rubrum. The lubber grasshopper Brachystola magna Gir. is more abundant on the highlands north and around Manhattan than it has been for several years.

Tennessee. G. M. Bentley (July 21): The outbreak of M. femur-rubrum and M. differentialis in several counties has been satisfactorily controlled. The nurserymen of Franklin County have reported that the peach leaves on young growing stock were badly eaten by grasshoppers before they knew of their presence.

L. B. Scott (July 16): Grasshoppers are still present in large numbers, with the most noticeable damage in tobacco. Where no baits have been applied the damage amounts to as much as 80 percent.

Arkansas. D. Isely (July 24): It has been estimated that 335,000 acres of crop land had potentially injurious infestation of grasshoppers during the latter part of June and the early part of July. The greater part of this infestation was M. differentialis. In some spots, however, M. mexicanus was the dominant species, and its appearance was earlier in June. The most seriously injured area was in the Delta between the St. Francis and Mississippi Rivers, in northeastern Arkansas, with some heavy infestation in the counties immediately west of this. The

outbreak has been brought under control fairly well. In the north-western part of the State, where injury was most severe in 1936, grasshoppers have been less numerous than average, except in a few spots. Where injury has occurred, the destructive species have been M. differentialis and M. femur-rubrum. M. bivittatus, ordinarily regarded as an unusual species in northwestern Arkansas, has been abundant in a few spots.

Oklahoma. F. A. Fenton (July 20): Grasshoppers continued to be the most injurious insect pest in Oklahoma during the past month. The most common species, M. differentialis, has now largely reached the adult stage and is prevalent in alfalfa and cotton fields. Most of the crops, with the possible exception of alfalfa, are beyond the point where they can be injured by these insects.

C. F. Stiles (July 22): Grasshoppers continue to be very numerous in Oklahoma, except in the extreme southeastern counties, and in some localities there are outbreaks. Corn, cotton, and alfalfa are suffering most at this time. Many cornfields are being completely defoliated and the third cutting of alfalfa is being seriously damaged, where the hoppers have not been poisoned. The species doing the most damage are M. bivittatus, M. differentialis, and M. mexicanus. The species most prevalent in the western Panhandle counties is Dissosteira longipennis Thos.

Alabama. J. M. Robinson (July 21): In Jackson County grasshoppers were reported on July 17 as being a very serious threat to field crops. The bird grasshopper (Schistocerca americana Drury) is causing serious concern at Deatsville attacking over 2 acres of cotton and about 1 acre of oat stubble. Adults were emerging on July 19.

Mississippi. C. Lyle (July 23): Schistocerca americana Drury was damaging corn and cotton at State College about the middle of July. It was necessary to use poisoned bait to control them. Infestations of grasshoppers have been found in Warren, Washington, and Quitman Counties, attacking cotton and other crops.

Texas. F. L. Thomas (July 23): Grasshoppers were damaging wheat on June 26 and 27 in Hemphill and Ochiltree Counties. Fifty percent of the wheat heads were on the ground at Canadian in Hemphill County and also in Dallam and Sherman Counties, of the north Panhandle area.

Idaho. C. Wakeland (July 21): Small local outbreaks of grasshoppers are being baited in Bear Lake, Bannock, and Caribou Counties, southeastern Idaho; in Fremont County, northeastern Idaho; in Lincoln and Gooding Counties, south-central Idaho; and in Payette County, southwestern Idaho. The population is increasing and we expect outbreak conditions in larger areas in 1938.

Utah. G. F. Knowlton (July 29): Grasshopper conditions are becoming increasingly serious as late-hatched nymphs increase in size.

Large populations are encountered in many localities in Northern Utah. Alfalfa is being seriously damaged at Liberty, Eden, and Smithfield by grasshoppers, 98 percent of which are nymphs. More of the grasshoppers are winged in central and southern Utah. Pastures are being damaged at Dry Lake, Sardine Canyon, and Benson. (July 19): Grasshopper damage is very severe to alfalfa in the Newton-Clarkston area. Damage is very severe in many parts of Millard County.

Arizona. O. L. Barnes (June 28): First-instar nymphs of the second generation of M. mexicanus were appearing generally in alfalfa fields in the Blaisdell district, 12 miles east of Yuma, on June 18. Populations ranged from 1 to 5 per square yard. A few nymphs were in the second instar. First-generation females were first noted on April 22 and were numerous by May 5. In 1936 first-instar nymphs of the second generation were first taken June 17.

MORMON CRICKET (Anabrus simplex Hald.)

North Dakota. F. G. Butcher (July 19): First actual reports of damage by Mormon crickets in North Dakota were obtained this month. These insects are alarmingly numerous, especially in southern Burleigh County, Emons County, and in McKenzie County. Some crop injury has been reported in these areas.

South Dakota. H. C. Severin (July 3): A. simplex has increased enormously in abundance in South Dakota this year. This is the first time in history when complaints have reached us that Mormon crickets are doing considerable damage in the State. The Mormon crickets are found in large numbers, chiefly west of the Missouri River, but they are numerous in the Ree Heights Hills, as far east of the Missouri River as Hand County. (July 21): The Mormon cricket situation is becoming more serious, especially in Butte and Lyman Counties.

Montana. H. B. Miller (July 22): Mormon crickets were laying eggs in Powder River County on July 10.

Utah. C. J. Sorenson (July 21): Mormon crickets are very abundant in Juab and Tooele Counties. They are only moderately abundant in Millard County, because of control work.

SUGAR BEET WIREWORM (Limonijs californicus Mann.)

California. R. E. Campbell (July 24): A letter just received says: "Wireworm damage in Ventura County this year has been more widespread and severe than any of the oldest inhabitants can recollect." Other reports indicate that at least three-fourths of the bean fields show wireworm damage in varying degrees.

JAPANESE BEETLE (Popillia japonica Newm.)

Connecticut. W. E. Britton (July 23): More prevalent than ever before in the southern half of Fairfield and New Haven Counties, and in the Hartford and New London areas. The heaviest infestations seem to be in Bridgeport, Hartford, New Haven, and Ridgefield. The earliest emergence recorded was on June 22. Two lots of adults from New Haven have been received for identification.

Rhode Island. A. E. Stone (July 23): The Japanese beetle is showing increase in present infested localities but so far as known no new localities have been discovered in which infestations are sufficiently heavy for people generally to discover them.

New York. E. P. Felt (July 23): P. japonica is more abundant than heretofore in southeastern New York. In some localities infestations approach outbreak proportions.

New Jersey. T. N. Dobbins (June): In the vicinity of Moorestown the first adult beetle above ground was found on June 14, whereas in 1936 the corresponding date was June 7. Adults increased slowly, probably as a result of the comparatively cool, cloudy weather, but by the end of the month they were becoming abundant locally, especially in southwestern New Jersey, where feeding damage became evident by the close of the month. The normal, evenly distributed rainfall of May and June provided ample soil moisture so that in most sections the soil is in excellent condition for rapid emergence and oviposition with the advent of normal July weather.

Delaware. L. A. Stearns (July 23): Severe injury throughout the northern portion of New Castle County. Apparently about the peak in the cycle of infestation by this insect.

Maryland. E. N. Cory (July 26): Many reports and requests for information being received from many parts of the State.

ASIATIC GARDEN BEETLE (Autoserica castanea Arrow)

Connecticut. W. E. Britton (July 23): This insect prevalent in certain localities and caused damage. Seventy-five adults were received from a garden in Stamford. It is attacking various flowering and vegetable plants.

WHITE-FRINGED WEEVIL (Naupactus leucoloma Boh.)

Florida. J. R. Watson (July 23): N. leucoloma apparently reached the peak of its emergence in Walton and Okaloosa Counties between July 10 and 15. It was estimated that there were close to 500,000 beetles per acre in some of these fields. The beetles are actively laying eggs. One of the most striking observations was that they are breeding parthenogenetically. A. N. Tissot was the first to observe that no males were to be found.

Florida and Alabama. H. C. Young (July 1): Known infested area, 35 square miles--20 square miles in Walton and 13 in Okaloosa Counties, Fla., and 2 in Covington County, Ala. One-third of area is in cultivated crops and remainder in cutover and woodland range. Host plants of the larvae are corn, cotton, velvetbeans, sugarcane, peanuts, sweet-potatoes, parsley, cocklebur, carpetgrass, paspalum, cabbage, collard, amaranthus, and apple trees. Adults attack cotton, corn, and peanuts.

Alabama. J. M. Robinson (July 14): Adults are emerging near Lockhart.

Mississippi. C. Lyle (August 10): Light infestation discovered at Laurel.

A WEEVIL (Calomycterus setarius Roelofs)

Connecticut. M. P. Zapoe (July 22): Adults plentiful in Stratford, about as many as last year. In old infestations at Sharon not so many adults as last year, but adults plentiful at two new localities in the southern part of town. Plants attacked are clover, sweet clover, Ampelopsis, and Helenium. Some injury to garden peas in one place.

GREEN JUNE BEETLE (Cotinis nitida L.)

Virginia. A. M. Woodside (July 21): Green June beetles became very numerous in codling moth bait pails at Staunton on July 6 and have continued so, although their numbers are now decreasing.

C. R. Willey (July 10): These beetles were swarming about and feeding on Chinese elms 4 miles east of Amelia and 5 miles southwest of Amelia they were as bad on several medium-sized black oaks, feeding on the tender new growth $\frac{1}{4}$ mile away. On the same farm they were swarming about several apple trees and several Wild Goose plums.

GRAPE COLASPIS (Colaspis brunnea F.)

Virginia. C. R. Willey (July 13 to 17): This beetle quite numerous on crape-myrtle and Deutzia in nurseries around Norfolk. Doing considerable damage to some by chewing tender tips of new growth.

Georgia. T. L. Bissell (July 29): Adults feeding on the inside of bracts surrounding cotton squares and bolls. Little damage apparent.

Arkansas. D. Isely (July 24): Has caused some local injury by feeding on the bracts of the cotton squares and on foliage in the northeastern part of the State.

Alabama. J. M. Robinson (July 14): Actively feeding on cotton and soybeans in Madison and Limestone Counties, adjoining Tennessee. Some years ago this beetle was observed in the Tennessee Valley, affecting the stands of cotton, corn, and soybeans, the larva

having fed on the roots of these plants. We also found that the larva feeds on the roots of lespedeza, which is grown in a large way as a hay crop in the Tennessee Valley. Apparently these insects are spreading into the cotton at this time.

CUTWORMS (Noctuidae)

Illinois and Wisconsin. N. F. Howard (July 1): Full-grown larvae of Prodenia ornithogalli Guen. were found in pea fields in Illinois and Wisconsin, but were not numerous enough to cause noticeable damage.

Nebraska. D. B. Whelan (July 22): Moths of the cotton cutworm (P. ornithogalli) have recently been very numerous at lights at Lincoln, reaching their peak about July 15-20, and indicating a possible outbreak later in the season.

Mississippi. C. Lyle (July 23): D. W. Grimes collected specimens of the yellow-striped armyworm (P. ornithogalli) at Durant on July 13. It was attacking cotton at Puckett on July 8.

Wisconsin. C. L. Fluke (July 20): Lycophotia margaritosa saucia Hbn. is in very destructive numbers in southern Wisconsin, particularly in Iowa, Grant, Lafayette, Green, Rock, Dane, Dodge, Columbia, Fond du Lac, and Manitowoc Counties. They emerged first in the hayfields and as soon as the hay was cut moved into adjoining grain, corn, or potatoes. Have also caused trouble in the barns around the milking machinery, many dying there and emitting considerable odor.

Minnesota. A. G. Ruggles (July 19): L. margaritosa saucia is very abundant. Reports coming from all over the State.

Nebraska. M. H. Swenk (July 22): A very severe outbreak of the variegated cutworm occurred from June 8 to July 10. It did considerable damage to alfalfa, corn, potatoes, many garden crops, flowers, meadows, shrubs, and trees. These complaints were received from many parts of the State.

South Dakota. H. C. Severin (July 3): Cutworms of several species, including the pale western cutworm (Porosagrotis orthogonia Morr.), have done an immense amount of damage in South Dakota this year. In fact, this has been the most destructive cutworm year we ever had in this State.

SUGAR BEET WEBWORM (Loxostege sticticalis L.)

North Dakota. F. G. Butcher (July 19): Sugar beet webworms have caused considerable alarm in various places, being particularly numerous in a weedy flax field in Grand Forks County and in potato, wheat, and barley fields in Foster County.

Idaho. C. Wakeland (July 21): Local outbreaks of the beet webworm in Latah and Benewah Counties, in northern Idaho. Lambsquarters has been almost completely defoliated and larvae have attacked peas, doing very heavy damage in small areas. The attack is much worse along the margins of the fields, but some injury occurs throughout the fields, owing to the presence of lambsquarters, on which the spring brood evidently oviposited. The second generation of moths began appearing July 13.

Colorado and Utah. O. A. Hills (July 6): Outbreaks this year are unusually numerous, particularly in the Grand Valley of Colorado, where this insect rarely becomes of economic importance. It has been necessary this year to spray about 15 percent of the sugar beets in western Colorado and eastern Utah.

GARDEN WEBWORM (Loxostege similalis Guen.)

Missouri. L. Haseman (July 24): During the first half of the month the garden webworm did much damage to corn, alfalfa, and garden crops in central Missouri.

Nebraska. D. B. Whelan (July 22): There have also been large flights of the moths of the garden webworm at the light trap. Trouble with this pest later in the season was indicated again on July 16-18.

Texas. F. L. Thomas (July 23): L. similalis is causing more injury than usual in central Texas in cotton and alfalfa in the Bell, Hunt, and Limestone Counties from the middle to the last of June.

WHITE-LINED SPHINX (Sphinx lineata F.)

Michigan. R. Hutson (July 22): The white-lined sphinx moth is common about Saint Johns and Lansing.

Wisconsin. C. L. Fluke (July 20): Extremely numerous in hay, potato, and alfalfa fields. Feeding mostly on purslane but unconfirmed reports on potatoes and sudan grass. Reported from nearly every county in south-central Wisconsin, running northeast from Lafayette County to Brown.

Minnesota. A. G. Ruggles (July 19): Larvae sent in from two-thirds of the counties of the State. So numerous that farmers are alarmed, but little damage thus far. Feeding mostly on purslane, then fireweed, then leafy spurge. Has been found feeding on lettuce and carrots and did some damage in a field of potatoes.

South Dakota. H. C. Severin (July 23): The white-lined sphinx has appeared in enormous numbers over the entire State. Considerable damage is being done to garden and field crops, as well as to shade trees.

Tennessee. L. B. Scott (July 22): Being taken in traps in large numbers in Montgomery County. This species is at least twice as numerous as in a normal year. No reports of damage by larvae have been received.

Idaho. C. Wakeland (July 21): Larvae are very abundant in several localities of this State and are occasioning many inquiries. Reports have been received from Fremont and Teton Counties of eastern Idaho and from Latah, Nez Perce, and Benewah Counties in northern Idaho. Larvae are feeding almost exclusively on dock and what is locally called tar-weed, only attacking other crops after these weeds are defoliated, at which time the larvae are practically mature; therefore little damage to economic crops is caused.

EIGHT-SPOTTED FORESTER (Alypia octomaculata F.)

South Dakota. H. C. Severin (July 23): The eight-spotted forester has been more abundant than usual and has done considerable damage to grape, woodbine, and related plants.

Nebraska. M. H. Swenk (July 22): Numerous reports of the presence of larvae on wild or cultivated grapes and woodbine were received from June 12 to July 15 from Sheridan, Lincoln, Howard, Nuckolls, Wayne, Lancaster, and Douglas Counties.

CEREAL AND FORAGE-CROP INSECTS

WHEAT AND OTHER SMALL GRAINS

ARMYWORM (Cirphis unipuncta Haw.)

Connecticut. R. B. Friend (July 20): Six acres of oats in Newington and about 5 acres of grass in an orchard in Farmington destroyed. Caterpillars about fully grown. Also reported from Guilford, where between 5 and 6 acres of grass and clover in an orchard and 1 acre of sweet corn were infested. The sweet corn was severely damaged. This insect has also been reported as feeding on grass in an orchard in Hampton.

New York. N. Y. State Coll. Agr. News Letter (July 6): Armyworms showed up in Niagara County this week, eating all the clover cover crop in one orchard. (July 26): Armyworms have come to the front during the past week in Chautauqua County. They are pretty well scattered over the entire county, but are serious only in a few places on the Lake Erie plain. The armyworms are heavily parasitized by braconids.

R. W. Leiby (July 19): Two local outbreaks on sudan grass and alfalfa appeared from July 13 to 15 in Suffolk County.

Pennsylvania. H. P. Antoine (July 27): Infesting oats and corn; 50 acres 50 percent damaged in Newton Township, Lackawanna County. Attack is localized.

Virginia. D. W. Jones (July 27): In Onley a few local cornfields are practically ruined at this time by armyworms of the second generation. They are now about $3/4$ inch long and have not yet begun to migrate.

E. J. Udine (June 10): Damage heavy. In an infestation at Timberville the barley stems were eaten off just below the heads, allowing the heads to drop to the ground. Damage was greatest in the low parts of the field.

Ohio. T. H. Parks (July 22): A flight of armyworm moths has been in progress for the last 4 weeks. They have been caught in large numbers in the codling moth bait pans, and at an electrocutor trap light. The numbers caught have decreased greatly during the last few days and the flight seems to be about over. Injury to ripening cherries by the moths was received from Lorain, Sandusky, and Franklin Counties. No complaints of outbreaks have been reported to us during July. The chief injury caused by the June outbreak was to young grass seeded in the wheatfields. This was destroyed in many fields of southwestern Ohio.

Illinois. W. P. Flint (July 21): The armyworm outbreak, which occurred during the last month has about run its course. There is still some trouble in the extreme northern counties, where the armyworm larvae are now about half grown. In this section of the State the worms are less numerous than they were in central and northern Illinois.

Michigan. R. Hutson (July 22): There is an outbreak of armyworms in the Saginaw Valley, in the east-central part of the State.

Wisconsin. C. L. Fluke (July 20): Outbreaks were just becoming apparent on July 17. Reports from Dane, Dodge, Columbia, Washington, and Fond du Lac Counties are more numerous than usual.

Minnesota. A. G. Ruggles (July 19): Armyworm reports beginning to come in from Clay County and some southern counties.

Iowa. C. J. Drake (July 14): The second generation of armyworms is doing some damage in oatfields. The infestation seems to be quite widespread in the northern half of the State.

North Dakota. J. A. Munro (July 20): Armyworms were present in most of the oatfields examined in the Harwood, Argusville, Durbin, and Kindred

vicinities. The infestations were spotted over Cass County. In one case where the field of oats was being cut--Durbin--the worms were moving out into an adjoining field of wheat. Reports, most of which were accompanied by specimens, indicate that the distribution of the worms is much more widespread than was the case in 1927. Reports have been received from points in Richland, Cass, Traill, and Sargent Counties. I noticed only a few tachinid flies in areas where the worms were prevalent.

- Oklahoma. F. A. Fenton (July 20): The *Calosoma* beetle which was so prevalent following the armyworm outbreak has been identified by the National Museum as *Calosoma lugubre* Lec.
- Montana. H. B. Mills (July 22): There is now a rather critical outbreak of the armyworm in Richland County.
- Utah. G. F. Knowlton (July 5): Armyworms are damaging wheat in one field near Roosevelt.

HESSIAN FLY (*Phytophaga destructor* Say)

- Ohio. J. S. Houser (July 1937): The hessian fly is less abundant in Ohio than it has been at any time since 1929. The average infestation of the 34 counties visited during the course of the annual wheatfield survey was found to be 4.4 percent. In 1936 the state-wide average was 12.4 percent. Clermont County, in the southwestern part of the State, was more heavily infested than any other. The average of the 10 fields examined was 15 percent. The lowest infestation in the State (2 percent) was found in Tuscarawas County. In 1936 Butler County ranked highest in the State, with an infestation of 50 percent, but this year the infestation there was only 5.7 percent.
- Minnesota. A. G. Ruggles (July 19): Hessian fly is scarce. One report received from Winona County.
- Missouri. L. Haseman (July 24): Stubble infestation in northeastern and southeastern Missouri is running as high as from 50 to 70 percent with, in some cases, as much as three-fourths of the flaxseeds showing parasitization in southeastern Missouri, according to recent observations by G. D. Jones.

WHEAT STEM MAGGOT (*Meromyza americana* Fitch)

- Ohio. E. W. Mendenhall (July 2): The wheat straw maggots are quite bad in wheatfields in western Counties--Miami, Champaign, Auglaize, and others.
- Kansas. H. R. Bryson (July 27): The wheat stem maggot is more abundant this year than it has been for several years, according to observations by R. H. Painter.

CORN

CORN EAR WORM (*Heliothis obsoleta* F.)

- Minnesota. A. G. Sandahl (July 20): Corn ear worm is moderately abundant in

Lake Crystal, Blue Earth County.

Iowa. E. V. Walter (July 14): Eggs and larvae are present on 84 percent of the ears in one field of early corn in Van Buren County. Counts made in sweet corn from July 12 to 15 showed 12 percent of the ears infested at Charles City and 16 percent at Belmond, in northern Iowa; 40 percent infested at Polk City, in central Iowa; and 80 percent infested at Chariton, in southern Iowa. Larvae, probably first brood in northern Iowa, were nearly full grown. In southern Iowa mature larvae had left the ears, and eggs presumably of the second generation constituted most of the infestation.

Missouri. L. Haseman (July 24): Corn ear worm has been very serious in the tassels of field corn and in early sweet corn ears. Worse for this season of the year than usual.

Nebraska. M. H. Swenk (July 22): Our only complaint of the corn ear worm so far this season was received on July 3 from Pawnee County, where it was working in popcorn.

Kansas. H. R. Bryson (July 23): This pest is still causing considerable injury to corn, particularly sweet corn.

STALK BORER (Papaipema nebris nitela Guen.)

Indiana. J. J. Davis (July 26): The common stalk borer was reported damaging corn at Noblesville and Elwood the first few days of July. At Elkhart it was reported damaging lilies on June 30. In all cases the specimens submitted were rather small, being hardly more than one-fourth grown.

Minnesota. A. G. Ruggles (July 19): The stalk borer is moderately abundant. A number of reports of injury to potatoes and corn.

Tennessee. G. M. Bentley (July 21): Reported as attacking cotton and corn grown in proximity of weed patches. The report has just come from Ripley, Lauderdale County, where there is a considerable infestation in woody cotton.

EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

Vermont. H. L. Bailey (July 26): Many adults about old cornfields in Essex, Chittenden County, northwestern Vermont, the last week in June and the first week in July. Scattering of moths noted in the county on July 21.

Massachusetts. A. I. Bourne (July 23): The European corn borer is at least normally abundant throughout the State. Here in the Connecticut Valley it is proving to be much more conspicuous generally than it was last year. We are beginning to note a considerable amount of damage from corn borer in fields of potatoes. This particular type of damage is most conspicuous in southern Hampden County, in fields just above the Connecticut State line. Early maturing sweet corn in many fields shows from 80 to 90 percent of the stalks infested and the ears are heavily infested.

Connecticut. N. Turner (July 21): Infesting sweet corn, the corn borer has been unusually destructive locally and is much earlier than in 1936. First-generation moths are present.

M. P. Zapoe (July 22): Very abundant in southern New Haven County. Many larvae have reached pupal stage. Attacking corn.

Indiana. J. J. Davis (July 26): According to reports from Auburn, emergence of corn borer moths was the latest of any season on record in Indiana. The first male adults were taken on June 23, nearly 2 weeks later than in 1936. The first female was taken June 25 and the first eggs June 28. Cool nights delayed oviposition; otherwise weather conditions have been ideal for borer increase.

A CORNSTALK BORER (Diatraea sp.)

Texas. O. D. Deputy (July 1): Green corn offered for sale in the markets at Brownsville seems to run about 25 percent damaged. The stem end of the ear is most frequently attacked.

CHINCH BUG (Blissus leucopterus Say)

Ohio. T. H. Parks (July 22): Excessive rains through June and July have completely eliminated the chinch bug as a problem for this season.

Indiana. J. J. Davis (July 26): The cool, wet weather has apparently checked the development of chinch bugs. In Porter County, in the extreme north end of the State, reports of conspicuous abundance were received on July 10. From Morgan County, in central Indiana, where chinch bugs have not been conspicuous for many years, came the report on July 15 that sorgo was being badly attacked in spots. The bugs submitted were from second instar to nearly mature. It is believed that these are the immediate progeny of overwintering bugs. Reports from Greene County (between Vincennes and Terre Haute) on July 20 indicate some trouble from the first brood, these being sufficiently numerous to indicate probable trouble from the next brood of bugs. The outbreaks are scattered and slow in showing up, making control applications difficult.

Nebraska. M. H. Swenk (July 22): Chinch bugs did slight damage to corn in Nemaha County during the second week in July, but were not injurious elsewhere in the State. No migrations were reported from elsewhere than Nemaha County.

Oklahoma. F. A. Fenton (July 20): Damage has been reported from Vinita, Craig County; Bixby, Tulsa County; and Haskell, Muskogee County, in north-eastern Oklahoma.

C. F. Stiles (July 22): Chinch bugs are present in larger numbers in Choctaw County, southeastern Oklahoma, than they have ever been, according to reports from old settlers. Corn in some fields has been seriously damaged.

A CERCOPID (Lepyronia quadrangularis Say)

New York. R. W. Leiby (July 13): This angulate frog hopper migrated to a field of corn from a freshly cut meadow and completely destroyed a portion of the field. In another field, where corn was just up, a third of a 15-acre field was destroyed. The injury took place during a period of very hot weather in Fonda.

SOUTHERN CORN ROOT WORM (Diabrotica duodecimpunctata F.)

Ohio. T. H. Parks (July 22): A serious outbreak of the larvae was reported in sweet corn during July. Reports came from Hamilton and Hocking Counties, southern Ohio.

Indiana. J. J. Davis (July 26): The southern corn root worm has been received as damaging corn from the northern half of the State, the first reports coming from Frankfort and Remington, on July 8 and 12, respectively. At Crown Point, corn following this spring's planting of sugar beets was damaged on July 14. At Connersville 90 percent of commercial sweet corn acreage in one field was destroyed on July 19. Considerable damage also reported from Winamac, Pulaski County, on July 21.

Missouri. L. Haseman (July 24): Serious throughout central Missouri. Beetles emerging in great numbers.

CORN ROOT WORM (Diabrotica longicornis Say)

Kansas. H. R. Bryson (July 16): Reported causing injury to corn at Garnett.

CORN SILK BEETLES (Luperodes spp.)

Mississippi. C. Lyle (July 23): The corn silk beetle was found attacking roses at Kilmichael on June 25, and cotton at Laurel, Ripley, and Decatur during the first week in July. It was also reported on cotton and corn at Lake on July 7 and on cotton at Aberdeen on July 20.

Louisiana. B. A. Osterberger and M. B. Christian (July): Found injuring corn in Franklin Parish. About 80 percent of the silks completely destroyed; very few grains of corn on ears. Also found injuring cotton.

CORN FLEA BEETLE (Chaetocnema pulicaria Melsh.)

Indiana. E. V. Walter (July 20): The corn flea beetle is much more numerous at this time of the year than it has been for the last 2 years at Lafayette.

ALFALFA

ALFALFA WEEVIL (Hypera postica Gyll.)

Utah. J. C. Hamlin (June): Injury by the alfalfa weevil was light this season,

except in Millard County, Utah, and in Douglas County, Nevada, where 50 percent of the fields were severely damaged. Scouting revealed the weevil in five counties not heretofore known to be infested; namely, Weston, Campbell, Sheridan, and Johnson in Wyoming, and Custer in South Dakota.

California. A. E. Michelbacher (July 19): In the San Joaquin Valley there was a marked increase in the alfalfa weevil population. On July 4 the average number of larvae collected per 100 sweeps of an insect net ran as high as 785. This increase is probably the result of a partial second generation. In the Pleasanton and San Francisco Bay areas the larval population has remained small. On July 12 the average number of larvae collected to 100 sweeps in the most heavily infested field in the San Francisco Bay area was 114. In other fields larvae and adults have been difficult to find. Parasitization by Bathyplectes curculionis Thos. has dropped very rapidly. On July 4 it was less than 1 percent in the San Joaquin Valley, while in the cooler regions it was about 12 percent.

POTATO LEAFHOPPER (Empoasca fabae Harr.)

Virginia. F. W. Poos (July 20): More abundant on alfalfa this season than at any time during the last 8 years. All cuttings are severely yellowed and injured. The yellowing began to show up as early as June 8, although this insect first appeared the night of May 5, only 2 days earlier than in some other years.

Indiana. J. J. Davis (July 26): Alfalfa yellows, caused by the potato leafhopper, has been unusually prevalent since July 15 throughout a large portion of the southern half of the State and extending north, at least as far as Lafayette. Also less conspicuous to the northern border of the State.

A CLOVER SEED CHALCID (Bruchophagus sp.)

Oklahoma. C. F. Stiles (July 22): The clover seed chalcid is quite numerous in the alfalfa-seed-producing area of Washita County.

THREE-CORNERED ALFALFA HOPPER (Stictoccephala festina Say)

Louisiana. L. O. Ellisor (July): Is very abundant in fields of alfalfa in the southern part of Louisiana. In some fields at least 75 percent of the alfalfa plants are girdled.

COWPEAS

COWPEA CURCULIO (Chalcodermus acneus Boh.)

Georgia. T. L. Bissell (July 23): The curculio is very destructive to cowpeas this year, unstung pods being hard to find. First-generation adults appeared in cages on July 18.

Alabama. J. M. Robinson (July 21): Active on cowpeas in central and southern Alabama.

VETCH

VETCH BRUCHID (Bruchus brachialis Fahraeus)

Pennsylvania. C. C. Hill (July 7): Heavy damage in Arendtsville by this pest.

SUGARCANE

SUGARCANE BORER (Diatraea saccharalis F.)

Louisiana. A. L. Dugas (July): Infestation of the sugarcane moth borer is generally light throughout the sugarcane area. A number of localized areas present a rather heavy infestation. The very abrupt decline in egg deposition in the last 2 weeks has been accompanied by a heavy natural parasitization of Trichogramma. An unidentified larval parasite was collected on July 26.

F R U I T I N S E C T S

SHOT-HOLE BORER (Scolytus rugulosus Ratz.)

Maryland. E. N. Cory (July 7): Found on Japanese weeping cherry at Pikesville.

Ohio. T. H. Parks (July 22): More than the usual number of complaints have been received about this insect in peach, plum, and cherry.

Indiana. J. J. Davis (July 26): Destructive to cherry at Hammond on July 5 and at Noblesville on July 10.

SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

New York. R. E. Horsey (July): A couple of branches on glossy buckthorn at Rochester were found to be infested with scale. Young moving scales were noted here on July 20.

Georgia. O. I. Snapp (July 13): Infestation has increased rapidly in a number of peach orchards at Fort Valley, central Georgia.

COMMON RED SPIDER (Tetranychus telarius L.)

Idaho. R. W. Haeghele (July 23): Within the last week or 10 days extremely severe infestations of the two-spotted mite have appeared on apples and prunes that were free of mites 2 weeks ago. Prune orchards sprayed 2 weeks ago for European red mite are now badly infested with the two-spotted mite.

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

Massachusetts. A. I. Bourne (July 23): There are indications that the codling moth is more abundant this year than for the last few seasons.

New York. D. W. Hamilton (July 24): First-brood adults began to emerge between July 12 and 15, and daily bait-trap captures are still increasing. Band captures were still increasing on July 19. Peak flight of first-brood moths will probably occur about August 2. Most of the first-brood entrances occurred during the second and third weeks of June; consequently there should not be as much late August and early September injury as there was in 1936.

New Jersey. E. Kostal (July 12): First-generation infestation seems to be the heaviest since 1933.

Delaware. L. A. Stearns (July 23): Injury at close of first-brood attack less than at any time since 1929. First first-brood moths emerged on July 2; peak flights on July 14 and 17. First second-brood eggs deposited on July 5 and first second-brood larvae emerged on July 9.

Virginia. A. M. Woodside (July 21): Adults of the first summer brood began to emerge at Staunton on July 5. Emergence has apparently passed its peak. Infestation is generally fairly light.

Georgia. C. H. Alden (July 21): Well-sprayed orchards at Cornelia have only a light infestation, even tho the weather has been dry and favorable for codling moth development.

Ohio. T. H. Parks (July 22): The bait-pan catch of moths has been rather low since June 23. No definite peak of second-brood moths has yet appeared, nor is one expected. The frequent summer rains have apparently done much to prevent many second-brood entrances.

Indiana. J. J. Davis (July 26): The first full-grown larvae left apples at Orleans, in south-central Indiana, on June 16, 2 days earlier than in 1936 and 3 days earlier than in 1935. However, cool, wet weather slowed up activity and the development of the second-brood worms is several days later than normal.

L. F. Steiner (July 22): Activity of first-brood adults as indicated by bait-trap captures, reached its peak in southwestern Indiana between July 14 and 17, or approximately 1 week later than in 1936. Although first-brood adults are only about half as abundant as the spring brood, the present population is nearly as great as that of the first brood in 1936, which was far above normal. Weather conditions have been much less favorable for second-brood establishment this season. In one moderately well-sprayed orchard first-brood worms averaged more than 25 per 100 apples, with additional sting injuries of 80 per 100.

Illinois. W. P. Flint (July 21): Second-brood codling moth was somewhat delayed because of the cool weather during the first part of July. The hatch of worms is now heavy over the entire southern half of the State.

Michigan. R. Hutson (July 22): The first adults of the second brood are beginning to appear at Buchanan, Monroe, Lapeer, Vandalia, and Allegan.

Minnesota. A. G. Rugles (July 19): Codling moth is moderately abundant.

Missouri. L. Haseman (July 24): Second-brood worms emerging all over the State but they are being effectively controlled.

H. Baker (July 30): The first first-brood moth was caught June 30 at Saint Joseph, in the northwestern part of the State. The first big catch was on July 15 and the peak catch to date was on July 24. Damage by second-brood worms is at its peak at present and is heavier than was anticipated. Abundance about average.

Nebraska. W. W. Darlington (July): Damage by the codling moth was identified from as far west as Sheridan County in apples sent in the first week of July. The survival of overwintering larvae at Lincoln was 67 percent, as indicated by larvae gathered under bands and placed in racks in the fall of 1936, and 57 percent of the overwintering larvae of the spring brood had pupated by May 12, when the initial 1937 observations were made. Pupation continued to June 24, although bulk pupation had occurred by May 29. The first moth emerged on May 22; peak of emergence, May 29; the last moth of this brood emerged on July 3; 60 percent of the spring-brood moths had emerged by May 29. In bait-trap catches at Agricultural College orchard the first and last moths were taken on May 19 and June 25, respectively, with the peak of catches on May 25, 28, and 29. Egg laying by moths of the spring brood began May 27 and continued through July 3, the largest number of eggs laid on any 1 day being on May 30. The earliest date on which first-brood larvae were found under bands was June 19, the number collected increasing daily to July 6. From July 7 to July 20 the number of larvae collected under bands gradually decreased; a sufficient number was collected on the latter date to indicate continuance of first-brood larvae for several weeks. Pupation of first-brood larvae began June 20 and reached its peak on July 6 and 10. First-brood moths began to emerge on July 3. Peaks of emergence occurred on July 10, 12, 18, 20. Oviposition by first-brood moths was first observed on July 11 and the greatest number of eggs were laid on July 16. First-brood moths have been taken in bait traps since July 11, with the largest single catch on July 16.

YELLOW-NECKED APPLE WORM (Datana ministra Drury)

Missouri. L. Haseman (July 24): Larvae were maturing on July 20 and are far more abundant in central Missouri than for years.

LEAFHOPPERS (Cicadellidae)

Indiana. J. J. Davis (July 26): Leafhoppers were reported as serious on apple at Valparaiso on June 23 and observations show them to be common and destructive throughout the State.

Massachusetts. A. I. Bourne (July 23): The white apple leafhopper (Typhlocyba pomaria McAtee) is most commonly encountered. This year our attention has been called to an unusual abundance of the green potato leafhopper

(Emposca fabae Harr.) and where it is abundant it has occurred at least 2 weeks later than the white apple leafhopper; therefore, its control offered further complications.

Connecticut. P. Garman (July 21): Potato leafhopper more abundant on apples than for the last 10 years in Hartford, New Haven County.

W. E. Britton (July 21): Specimens of Emposca fabae Harr. on apple have been received from Norfolk and Cannondale.

APPLE MAGGOT (Rhagoletis pomonella Walsh)

Maine. F. H. Lathrop (July 19): The first fly of the season emerged in a cage at Monmouth, Kennebec County, on June 24. Emergence nearing the peak on July 19.

Massachusetts. A. I. Bourne (July 23): Apple maggot emerging normally and seems to be normally abundant.

Connecticut. P. Garman (July 21): Flies began to emerge this year much earlier than usual in our cages and have been observed in fair numbers in certain orchards.

New York. N. Y. St. Coll. Agr. News Letter (July 6): Apple maggot flies are emerging steadily in the Hudson Valley from cages operated by entomologists of the Poughkeepsie staff. In general, it might be said that emergence records and weather conditions indicate a favorable season for the development of apple maggot.

New Jersey. E. Kostal (July 12): Flies scarce and emergence late. First flies noted on June 25. Larval infestation in early apples light.

FLATHEADED APPLE TREE BORER (Chrysobothris femorata Oliv.)

Indiana. J. J. Davis (July 26): The flatheaded apple tree borer was reported to be killing maple trees at Frankfort on June 19 and at Greentown on June 22.

Missouri. L. Haseman (July 24): During the month the adult beetles have continued to be unusually abundant, with some evidence of tree infestation by the larvae. Some larvae practically full grown on July 24.

Kansas. H. R. Bryson (July 27): The flatheaded apple tree borer appeared from June 20 to July 23. Because of the drought of the last four or five seasons, trees have become weakened and this insect has caused and is still causing considerable damage to shade and fruit trees, as well as to some shrubs. Reports of injury have been received of this pest injuring walnut trees at Pittsburg and shade trees at Topeka, Arnold, Olathe, Kansas City, and Leavenworth.

Oklahoma. F. A. Fenton (July 20): The flatheaded apple tree borer continues to be possibly the most destructive tree borer in Oklahoma. Reports of borer damage have been received from Claremore, Roff, Chickasha, Roose-

vett, and Prague.

PACIFIC FLATHEADED BORER (Chrysobothris mali Horn)

Arizona. C. D. Lebert (July 22): Quite a number of shrubs in local yards at Phoenix have been severely injured or killed by this borer. Common among the host plants are Pyracantha, rose, sycamore, willow, and poplar. Infestations seem more numerous this season than usual.

APPLE SEED CHALCID (Syntonaspis druparum Boh.)

Maine. F. H. Lathrop (July 19): The first adult emerged in cage at Monmouth, Kennebec County, on June 16. Emergence reached a peak on June 24.

A LEAF MINER. (Ornix geminatella Pack.)

Kansas and Missouri. H. Baker (July 30): This insect, which is usually present in small numbers and of minor importance, is unusually abundant in northeastern Kansas and northwestern Missouri.

PEACH

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Maine. F. H. Lathrop (July 19): Larvae began leaving dropped apples at Monmouth, Kennebec County, during the week ended July 17.

New York. N. Y. St. Coll. Agr. News Letter (July 6): In Monroe County, western New York, the plum curculio has caused almost a total loss of some prune crops.

Delaware. L. A. Stearns (July 23): The peak of first-brood adults, as determined by jarring at Bridgeville, Sussex County, was on July 8. Injury will be light.

Virginia. A. M. Woodside (July 21): Some adults were collected in May at Staunton; still alive in the insectary but feed very little and no eggs have been found for over 2 weeks. All of the beetles from drops have emerged, but none found to contain eggs and no eggs have been found in the cages. Beetles feed greedily but do not mate.

Georgia. O. I. Sharp (July 20): At Fort Valley the second-generation egg deposition began on July 6, just before the Elberta peaches began to ripen; therefore that variety was subjected to a second-brood attack this year. All other varieties of peaches escaped a second brood of larvae. Forty-nine percent of the first-generation females had started to deposit second-generation eggs by July 20. The infestation is lighter than average.

Missouri. L. Haseman (July 24): This pest is seemingly greatly delayed in its breeding. Some varieties of plums at Columbia show considerable numbers of larvae from half to full grown.

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Connecticut. P. Garman (July 21): In Hartford and New Haven Counties second-generation larvae are abundant in many orchards.

New York. N. Y. St. Coll. Agr. New Letter (July 19): In Orleans and Niagara Counties terminal injury of the Oriental Fruit Moth is becoming more conspicuous.

Delaware. L. A. Stearns (July 23): Injury by second brood moderately severe. Brood about mature. Parasitization approximately average.

Virginia. W. J. Schoene (July 21): Infested peach twigs, which became numerous about 2 weeks ago, are dropping off in numbers. Considerable fruit infestation is appearing in some orchards in Staunton.

Georgia. C. H. Alden (July 20): Fruit scored at harvest showed about 2.0 percent infestation, as compared with 0.5 percent in 1936. This insect is increasing slightly over the upper middle and northern parts of the Peach Belt, at Thomaston and Monticello.

Mississippi. C. Lyle (July 23): Peach twigs injured by this insect were received from Columbia on July 16. M. L. Grimes, of Meridian, and D. W. Grimes, of Durant, report injury to peach twigs in their districts.

TARNISHED PLANT BUG (Lygus pratensis L.)

Kansas. H. R. Bryson (July 20): Reported causing injury to peaches at Mound City. In one instance 50 percent of the fruit dropped from the trees after being punctured. More abundant generally than last year.

APRICOT

A CHRYSOMELID (Coscinoptera dominicana F.)

Indiana. J. J. Davis (July 26): Reported eating new leaves of apricot at Anderson on July 7.

GRAPE

GRAPE BERRY MOTH (Polychrosis viteana Clem.)

Virginia. C. R. Willey (July): Much more numerous than usual, judging from my own and my neighbors' grapes and by requests for identification and control.

GRAPE LEAFHOPPER (Erythroneura comes Say)

New York. N. Y. St. Coll. Agr. New Letter (July 19): In Niagara County the grape leafhopper hatch appears about complete with older nymphs developing wing pads. In a few vineyards these pests will cause considerable damage. Also reported from Ulster, Dutchess and Columbia Counties.

- Delaware. L. A. Stearns (July 23): Population so light that the usual spray in early July was omitted.
- Virginia. C. R. Willey (July): I never saw a worse infestation of leafhoppers than in Henrico County, 2 miles north of Richmond. They were there in swarms, all stages of nymphs and adults.
- Ohio. T. H. Parks (July 22): Serious outbreaks developed in vineyards of Licking and Franklin Counties, central Ohio, early in July. Spotted outbreaks now in northeastern Ohio.
- Indiana. J. J. Davis (July 26): Grape leafhopper was normally abundant in June, in many sections of the State.
- South Dakota. H. C. Severin (July 23): The woodbine leafhopper (E. cones vitis Harr.) is just now coming into its own and is causing considerable damage to grape, woodbine, and related plants.
- Utah. G. F. Knowlton (July 1): Grape leafhoppers are causing some injury to Virginia creeper and grape in northern Utah.
- California. M. S. Morley (July 9): Vineyardists in Kern County are dusting and spraying grapevines for control of grape leafhoppers. Some untreated vineyards are showing considerable injury from attacks of this pest.

GRAPE PHYLLOXERA (Phylloxera vitifoliae Fitch)

- Ohio. E. W. Mendenhall (July 19): The grape phylloxera is injurious, affecting the Clinton variety.

PECAN

WALNUT CATERPILLAR (Datana integerrima G. & R.)

- Kentucky. M. L. Dillake (July 24): Walnut worms are generally abundant.
- Missouri. L. Haseman (July 24): Walnut datana has been worse this year than I have ever seen it.
- Oklahoma. F. A. Fenton (July 20): The walnut datana was very prevalent throughout the Pecan Belt of the State, and has caused widespread defoliation and stripping of pecan and walnut trees. This is the third successive season stripping has occurred. The first moths of the second generation have emerged. Reports of damage by first-generation moths have come from Muskogee, Bristow, and Prague.

A PECAN PHYLLOXERA (Phylloxera sp.)

- Texas. F. L. Thomas (July 23): Phylloxera are rather severe on pecan trees in San Antonio.

WALNUT

PECAN LEAF CASEBEARER (Acrobasis juglandis LeB.)

Connecticut. E. P. Felt (July 23): The pecan leaf casebearer was reported as causing considerable injury to black walnut foliage at Brookfield.

CITRUS

CITRUS WHITEFLY (Dialeurodes citri Ashm.)

Mississippi. C. Lyle (July 23): Inspectors in the Meridian and Durant areas report heavy infestations of the citrus whitefly on ornamentals. Also reported on satsuma at Poplarville.

Louisiana. I. J. Bechnel (July): Most whiteflies are in the nymphal stage.. Very few adults found at Buras, south of New Orleans. Adults and eggs numerous in a grove at the extreme northern end of Plaquemines Parish.

PURPLE SCALE (Lepidosaphes beckii Newm.)

Louisiana. I. J. Bechnel (July): Heavy infestations were found in many groves near Buras and Venice south of New Orleans, in Plaquemines Parish. Crawlers and young scales are very numerous.

SNOW SCALE (Chionaspis citri Comst.)

Louisiana. I. J. Bechnel (July): An infestation of snow scale was found in a grove near Triumph, Plaquemines Parish. Adults very numerous, especially on twigs and medium-sized branches.

A CITRUS MITE (Anychus clarkii McG.)

Texas. S. W. Clark (July 1): Very abundant in most orchards at Weslaco.
(July 15): Abundant and causing some damage near Mission and Edinburg.

CALIFORNIA RED SCALE (Chrysomphalus aurantii (Mask.))

Texas. S. W. Clark (July 15): Infestations are becoming serious in the Mission and Edinburg areas.

CITRUS RUST MITE (Phyllocoptes oleivorus Ashm.)

Florida. J. R. Watson (July 23): Over a considerable portion of the Citrus Belt, particularly in the northern part, the July rainfall was considerably less than normal; therefore rust mites persisted longer than usual.

Louisiana. I. J. Bechnel (July): Few growers have complained of rust mite infestations. Several growers in Plaquemines Parish have dusted with sulphur, to eliminate the chances of damaged fruit.

Texas. S. W. Clark (July 15): Moderately abundant at Weslaco and over the entire Rio Grande Valley.

TRUCK - CROP INSECTS

BLISTER BEETLES (Meloidae)

Vermont. H. L. Bailey (July 26): Black blister beetles (Epicauta pennsylvanica Deg.) are reported as damaging potato plants and larkspur in east-central Vermont.

New York. R. W. Leiby (July): The ash-gray blister beetle (Macrobasis unicolor Kby.) is reported as proving disastrous to the potato crop in Montgomery County.

Tennessee and Kentucky. L. B. Scott (July 29): Many reports have been received particularly from the vicinity of Montgomery County, Tenn. E. vittata Fab. and M. unicolor predominate. Severe damage to watermelons has been noted.

SOUTHERN GREEN STINKBUG (Nezara viridula L.)

Florida. J. R. Watson (July 23): Has been scarce in the peninsula, but was very abundant in the western part of the State last month.

Alabama. J. M. Robinson (July 21): Green stinkbug adults are feeding on beans and peas in southeastern Alabama and there is a moderate infestation at Auburn.

Louisiana. C. O. Eddy (July): The green stinkbug, the southern leaf-footed plant bug, and the squash bug have been abundant during the last month.

POTATO AND TOMATO

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

Maine. G. W. Simpson (July 18): In Arcostook County, eggs laid early hatched well and the resulting larvae have finished feeding and have entered the ground to pupate. Eggs are still being laid and considerable damage is being done in certain sections by the larvae.

New York. N. Y. St. Coll. Agr. New Letter (June 28): Potato beetles are beginning to appear and are doing some damage in Saratoga County, eastern New York. Beetles and slugs appeared in small numbers during this week in Erie County. They are laying eggs freely on eggplant in Monroe County. (July 19): In Monroe County, there are more bugs than usual.

Minnesota. K. A. Kirkpatrick (July 15): Farmers are commenting on the small number of beetles this year, as compared to other years. Some large growers report that they have not had to spray for them. It is interesting to note that the irrigated fields show the least presence of larvae. Irrigation is overhead, and apparently the cool water discourages these insects from doing damage.

North Dakota. J. A. Munro (July): From scarce to moderately abundant over the potato-growing districts I have examined in Walsh and Cass Counties, but sufficiently injurious to require poisoning.

Alabama. J. M. Robinson (July 21): Potato beetles are moderately abundant on eggplant and tomatoes at Auburn.

POTATO FLEA BEETLE (Epitrix cucumeris Harr.)

Vermont. H. L. Bailey (July 24): Less abundant than usual throughout the State.

Massachusetts. A. I. Bourne (July 23): Have been unusually abundant and persistent on garden and field crops, particularly on tomatoes, potatoes, and tobacco.

Connecticut. N. Turner (July 19): As abundant as usual and locally very destructive.

New York. N. Y. St. Coll. Agr. News Letter (August 2): In Suffolk County leafhoppers and flea beetles have been responsible for the early death of Cobblers in many instances.

North Dakota. J. A. Munro (July 20): Are appearing most in potato fields. Here at Fargo adults of the first brood began appearing about July 16.

Utah. G. F. Knowlton (July 1): Injury to potato and tomato plants observed in the Salt Lake area.

BANDED CUCUMBER BEETLE (Diabrotica balteata Lec.)

Alabama. J. M. Robinson (July 21): Moderately abundant at Auburn.

Texas. F. L. Thomas (July 23): Damaging tomato plants in Kendall County, west-central Texas.

CORN EAR WORM (Heliothis obsoleta F.)

Delaware. L. A. Stearns (July 2): Causing serious injury to tomato at Clayton.

Maryland. E. N. Cory (July 27): Early and numerous infestation on tomatoes July 7. On July 24 reports beginning to come in of injury to corn. Infestation general over the State.

J. A. Hyslop (August 7): One out of 10 ears infested at Avanel.

Georgia. T. L. Bissoll (July 22): Tomatoes at Atlanta and Griffin are much freer of the corn ear worm than they were a month ago.

Ohio. T. H. Parks (July 22): Corn ear worms have caused serious damage to early tomatoes along the Ohio River and to the early sweet corn now being marketed.

Indiana. J. J. Davis (July 26): The corn ear worm has been an outstanding pest of tomatoes during the last month. The first report came on June 23 from Gibson County, closely followed by reports from other counties in the southern half of the State. In some fields this first brood of worms infested 80 percent of the fruits. The only reports of infestation in corn came to us from Jefferson County on June 29 and from Spencer County on June 30. These infestations were earlier than usual, doubtless because the mild winter permitted the insect to overwinter farther north than normal, although observations indicate that they did not winter as far north as Orleans. Most of the worms have left tomatoes and are in the pupal stage in the soil. No appreciable infestations were found in tomatoes north of Indianapolis.

Illinois. W. P. Flint (July 21): Larvae much more abundant than usual over the entire State. Severe injury has occurred to tomatoes and sweet corn in southern Illinois. Some damage to tomatoes in greenhouses in northern Illinois has been reported.

Kentucky. M. L. Didlake (July 24): Tomato fruit worms are doing considerable damage at Lexington, Versailles, and Calhoun.

California. J. Wilcox (July 15): In southern California damage in several fields of early tomatoes has increased with the advance of the season. The first picking, made about June 20, showed about 10-percent damage, whereas the third picking, made about July 10, showed about 20-percent damage, as did also the first picking of intermediate tomatoes made about July 15.

TOMATO WORM (*Protoparce sexta* Johan.)

Tennessee. G. M. Bentley (July 21): Has been unusually bad on partly grown and full-grown tomatoes generally throughout the State. One grower reported that he picked 16 bushels and, upon grading them, had 1 bushel free from the worm.

Utah. H. E. Dorst. (July 28): Tomato fruit worm eggs average about one per tomato plant in the Hooper district, northern Utah. Damage is moderate.

G. F. Knowlton (June 30): Hornworms are damaging tomatoes (July 14): Hornworm larvae are damaging tomato foliage at Willard, Tremonton, and Utah Hot Springs. (July 26): Hornworms have damaged tomato foliage at Salem and Geneva, in Utah County.

Nevada. G. G. Schweis (July 30): We have had two outbreaks of the tomato sphinx moth (*P. sexta*) larvae on potato plants in July. Both of these outbreaks were rather widespread, one being in Douglas County and one in Pershing County. The Douglas County outbreak was controlled by ravens which appeared in the infested fields in large numbers and got practically all of the insects. In Pershing County it was necessary to resort to dusting with calcium arsenate for effective control.

California. A. E. Michelbacher (July 19): The first brood of hornworms for the most part are in the pupal stage. In places in the warmer interior valleys in middle and central California considerable damage occurred.

POTATO LEAFHOPPER (Empoasca fabae Harr.)

Massachusetts. A. I. Bourne (July 23): Not very abundant.

Connecticut. N. Turner (July 19): Unsprayed potatoes show serious tip-burn from E. fabae. Abundance, usual.

New York. N. Y. St. Coll. Agr. News Letter (June 28): In Suffolk County the leafhoppers are beginning to appear. Leafhoppers can be found in only relatively small numbers at present. (July 2): Leafhoppers are becoming numerous on potatoes. (July 12): In Dutchess County leafhopper activity is subsiding, with a great deal of injury having been done to the last 6 to 10 leaves on terminal growth of more vigorous varieties. In some instances the smaller leaves have curled, dried, and dropped. (July 19): In Orleans County hoppers are on the increase. (July 26): In Orange County on black dirt there has been considerable injury from leafhoppers, and quite a few fields of potatoes have died prematurely. (August 2): In Suffolk County leafhoppers and flea beetles have been responsible for the early death of Cobblers in many instances. Leafhoppers have been particularly severe in the area about Huntington and East Northport.

Maryland. E. N. Cory (June 29): Leafhoppers are infesting potatoes at Easton.

Virginia. F. W. Poos (July 15): Infestation at Holland and Suffolk. Potatoes were much more severely injured than usual. After the potatoes died these leafhoppers moved to peanuts and cotton, and fields of these crops adjoining potatoes are being severely injured. East of Suffolk, where more potatoes were grown, the injury to peanuts is general.

Indiana. J. J. Davis (July 26): Abundant and destructive to potatoes and beans throughout the State.

North Dakota. J. A. Munro (July 20): Moderately abundant to abundant near Fargo. Scarce in fields at Park River, Walsh County.

A LEAFHOPPER (Empoasca filamenta DeL.)

Utah. G. F. Knowlton (June 30): This leafhopper is moderately abundant on potato foliage and beans at Roy, Brigham, Pleasant Grove, and Salt Lake City. Injury evident in some cases.

POTATO APHID (Illinoia solanifolii Ashm.)

Massachusetts. A. I. Bourne (July 23): The hot weather of the last 2 weeks has been favorable for the rapid increase of potato aphids and in many fields these are beginning to become very abundant.

Connecticut. N. Turner (July 19): Infestation not quite so heavy as a year ago.

New York. N. Y. St. Coll. Agr. News Letter (July 6): Aphid can be readily found, although not numerous enough to cause any injury in Suffolk County. (July 12): Beginning to appear in some fields in Nassau County. (August 2): Although the aphids were very abundant for a period of about 3 weeks they are now heavily parasitized and disappearing rapidly in Suffolk County.

Indiana. J. J. Davis (July 26): Reported very abundant on tomatoes at Greenfield, Tipton, Muncie, and Fowlerton from June 25 to July 5.

Utah. G. F. Knowlton (July 26): Damaging tomatoes in one field at Lindon, in Utah County.

BUCKTHORN APHID (Aphis abbreviata Patch)

Maine. G. W. Simpson (July 19): Development on buckthorn was largely favorable, except for syrphid-fly larvae. While colonies were less numerous than usual they were larger, therefore the migrating forms were probably as numerous as usual. Dispersal from summer food plants is now going and the infestation on potatoes is more general throughout Aroostook County than that of the other three potato aphids.

BEET LEAFHOPPER (Eutettix tenellus Bak.)

Utah. G. F. Knowlton (June 30): Moderately abundant on potatoes at Roy. (July 20): Curly-top of tomatoes carried by the beet leafhopper averages 23 percent of plants infested at Utah Hot Springs, more than 50 percent in some fields at Hooper, 15 percent at Perry, 11 percent at Sunset, and other localities ranged from 2 to 10 percent in fields examined.

TARNISHED PLANT BUG (Lygus pratensis L.)

Vermont. H. L. Bailey (July 26): Abundant on potato plants in Franklin County, northwestern Vermont, July 23. Some damage to tips of new growth.

Indiana. J. J. Davis (July 26): Responsible for severe injury to 7 acres of potatoes near Rochester on July 17.

COTTON DAUBER (Lygus spp.)

Utah. G. F. Knowlton (June 30): L. elisus Van D. and L. hesperus Knight are injuring potato foliage causing wilting in fields examined at Willard, Midvale, Granite, Pleasant Grove, and Hooper.

LEAF-FOOTED BUG (Leptoglossus phyllopus L.)

Georgia. T. L. Bissell (July 12): At Griffin, central Georgia, adult bugs are swarming on tomato fruits.

SUCKFLY (Dicyphus minimus Uhl.)

Texas. F. L. Thomas (July 23): Injuring tomatoes at Floresville in Wilson County, southern Texas.

POTATO PSYLLID (Paratrioza cockerelli Sulc.)

Utah. G. F. Knowlton (June 30): Not yet abundant on potato plants at Roy, Brigham, Plain City, and Salt Lake City. Adults were abundant on matrimony vine, however, at Nebo and Moroni.

POTATO STALK BORER (Trichobaris trinotata Say)

Maine. G. W. Simpson (July 19): Potato stalks killed by a stalk borer caused enough injury in early July to attract the attention of several farmers. Injury was more extensive than in recent years.

Indiana. J. J. Davis (July 10): Damaging eggplant at Terre Haute.

Mississippi. C. Lyle (July 2): Larvae, probably belonging to this species, were in an eggplant stem received from Gunnison.

BEANS

MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

New York. N. Y. St. Coll. Agr. News Letter (August 2): Causing severe damage to wax beans, and some to dry beans in Broome County. Green string beans do not seem to show as much damage as the others.

New Jersey. E. Kostal (July 12): Damage is severe in Morganville, Monmouth County. This species has been exceptionally abundant and destructive this season.

Delaware. L. A. Stearns (July 23): Infestation has developed rapidly since last report and will exceed that of 1936.

Maryland. E. N. Cory (July 26): Is generally injurious.

South Carolina. C. O. Bare (July 12): Approximately two dozen plants in a bean garden in Windermere, Charleston County, were found to be severely damaged.

Georgia. O. I. Snapp (July 20): Noticeably less abundant than usual at Fort Valley, central Georgia.

T. L. Bissell (July 20): Beans have been free from this pest for 3 or 4 weeks. New adults are now present on beans that have been watered at Experiment, central Georgia.

Ohio. T. H. Parks (July 22): Damage from this insect is now quite severe in Ohio.

Indiana. J. J. Davis (July 19): Abundant at Fort Wayne in the northeastern corner of the State. Showed considerable defoliation of garden beans in the southern part of the State from June 20 to 22.

Tennessee. L. B. Scott (July 15): Damage moderate. Is normally abundant. The infestation is more severe than in 1936.

Mississippi. C. Lyle (July 23): Complaints have been received from Yalobusha County this month.

SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata F.)

Virginia. A. M. Woodside (July 21): Doing almost as much damage to beans in some gardens at Staunton as the bean beetle. It eats holes in the pods.

Kentucky. M. L. Didlake (July 24): Seriously damaging beans at Calhoun and corn at Berry.

BEAN LEAF BEETLE (Cerotoma trifurcata Forst.)

Louisiana. La. Agr. Expt. Sta. Bug News. (July 21): The holes that are being made in the leaves of beans and soybeans now are caused by the bean leaf beetle.

ROSE CHAFER (Macrodactylis subspinosus F.)

New York. N. Y. St. Coll. Agr. News Letter (July 6): In Wayne County the rose chafers were found to be causing rather severe damage to a 5-acre field of kidney beans.

BEAN THRIPS (Heliothrips fasciatus Perg.)

Mississippi. C. Lyle (July 23): Thrips were found injuring butter beans at Jackson and Moss Point.

Utah. G. F. Knowlton (July 13): Bean thrips are damaging string beans at Pleasant Grove.

BEAN APHID (Aphis rumicis L.)

Michigan. R. Hutson (July 22): Causing trouble in beanfields about Lake Odessa.

CABBAGE

IMPORTED CABBAGE WORM (Ascia rapae L.)

New York. R. W. Leiby (July 19): Severe injury to cabbage is threatened by the imported cabbage worm, as the butterflies are present in large numbers. Many eggs have been deposited on young late cabbage in western New York. On July 5 a 3-acre field of early cabbage was being infested at Elmira and was white with adults in flight. The picture was suggestive of a cloud of white feathers darting back and forth over the field.

N. Y. State Coll. Agr. News Letter (August 2): In Orleans County the first brood of imported cabbage worms is practically through. Second brood butterflies are now depositing eggs.

Indiana. J. J. Davis (July 26): More common than normal at this season.

Minnesota. A. G. Sandahl (July 20): Very abundant at Lake Crystal, Blue Earth County.

South Dakota. H. C. Severin (July 3): The imported cabbage worm again promises to be destructive. Full-grown caterpillars were observed feeding on cabbage during the week ended June 26.

Utah. G. F. Knowlton (July 1): Cabbage butterflies are moderately abundant in northern Utah, with some damage from the diamondback and cabbage butterfly larvae on young plants.

SOUTHERN CABBAGE WORM (Ascia protodice Bdv. & Lec.)

South Dakota. H. C. Severin (July 2): A terrific outbreak has taken place. The ratio this year of the southern and imported butterflies must be at least 100 to 1. This is very unusual for South Dakota, where the southern cabbage butterfly is ordinarily scarce.

DIAMONDBACK MOTH (Plutella maculipennis Curt.)

New York. N. Y. State Coll. Agr. News Letter (July 12): At Geneva, Ontario County, the most common cabbage worm is the larva of the diamondback moth. Usually this species does not become very abundant until August or September. In Monroe County diamondbacks are present in all stages and are beginning to lay eggs freely. (July 26): In Niagara County the diamondback has caused considerable loss.

Utah. G. F. Knowlton (July 1): Diamondback moths abundant in northern Utah, with some damage on young cabbage plants.

CABBAGE LOOPER (Autographa brassicae Riley)

New York. N. Y. State Coll. Agr. News Letter (June 28): In Niagara County the loopers can be found. (July 12): In Onondago County cabbage loopers are appearing in numbers. (July 6): In Suffolk County they are becoming quite numerous in the cauliflower seedbed. (July 9): In Ontario County, as is usually the case this time of the year, eggs and larvae are scarce.

Indiana. J. J. Davis (July 26): Caterpillars have not yet showed up in injurious numbers.

South Dakota. H. C. Severin (July 23): Beginning to show up in large numbers in many localities.

Nebraska. D. B. Whelan (July 22): Moths have been very numerous at lights at Lincoln; most abundant from July 14 to 22.

CABBAGE APHID (Brevicoryne brassicae L.)

New York. N. Y. State Coll. Agr. News Letter (July 6): In Suffolk County the aphids are beginning to appear in cauliflower seedbeds. In Ontario County there were practically no cabbage aphids up to July 9.

South Dakota. H. C. Severin (July 23): Beginning to show up in large numbers in many localities.

Utah. G. F. Knowlton (July 3): Just beginning to infest cabbage plants at Morgan.

CABBAGE CURCULIO (Ceutorhynchus rapae Gyll.)

Indiana. J. J. Davis (July 26): Adults were reported feeding on cabbage and radish foliage at Idaville on July 2 and on cabbage at Winamac on July 9, both localities in the northern third of the State.

Michigan. E. I. McDaniel (July 13): Working on plants at Cassopolis, causing some little injury. This species is rather rare.

HARLEQUIN BUG (Murgantia histrionica Hahn)

Virginia. W. R. Lewis (July 21): Destroying all crucifers at The Plains.

Tennessee. G. M. Bentley (July 21): Several reports have come to the office of very heavy infestations on cabbage.

CABBAGE MAGGOT (Hylemyia brassicae Bouche)

New York. N. Y. State Coll. Agr. News Letter (July 19): In Nassau County a late infestation of the cabbage maggot caused a 50-percent loss on a 1-acre field of broccoli in Ozone Park.

PEAS

PEA APHID (Illinoia pisi Kltb.)

Maine. J. E. Hawkins (July 17): Planting dates later than other years. More abundant than last year at Hartland.

New York. N. Y. State Coll. Agr. News Letter (July 6): In Niagara County the pea aphid has let up, except in badly infested plantings. (July 12): In Ontario County at Geneva by July 7 the pea aphid had been decreasing steadily for the past 2 weeks; now greatly reduced in most pea fields in western New York.

Utah. G. F. Knowlton (July 1): Control operations are now in progress in Weber Cache, Box Elder, and Utah Counties. Most of the early peas have escaped serious injury. (July 20): Decreasing in abundance on peas and alfalfa

Idaho. C. Wakeland (July 21): Has not caused severe injury to peas in Idaho, although it is somewhat more abundant in northern Idaho than usual. Most of the peas in southeastern Idaho were harvested for canning with little loss, as compared to complete failure in many fields last year.

SAY'S STINKBUG (Chlorochroa sayi Stal)

Utah. G. F. Knowlton (July 2): Adults have been observed recently on peas in several localities in Cache County.

MELONS AND CUCUMBERS

STRIPED CUCUMBER BEETLE (Diabrotica vittata F.)

New York. N. Y. State Coll. Agr. News Letter (June 28): In Niagara County the striped cucumber beetle has been numerous and destructive. (July 6): In Monroe County the cucumber beetles on melons have been very numerous and the frequent rains have necessitated frequent dusting for these pests. (July 12): In Onondaga County cucumber beetles are numerous on squash and melons. (July 19): In Orleans County the cuke beetles are very abundant, mostly the jail-bird type, with stripes.

Kentucky. M. L. Didlake (July 24): The striped cucumber beetle is abundant at Frankfort and Princeton.

Wisconsin. C. L. Fluke (July 20): The larvae are injuring roots of cucumbers and melons in Dane County. Damage in two fields estimated at 25 percent.

Minnesota. A. G. Ruggles (July 19): The striped cucumber beetle is moderately abundant.

Missouri. L. Haseman (July 24): Early in the season few complaints were received regarding this pest but since the middle of July it seems to have appeared in central Missouri in goodly numbers, attacking late-planted cucurbits.

Tennessee. L. B. Scott (July 16): Present in numbers sufficient to destroy many plantings of melons in Montgomery County. The injury appears to be unusually severe in the stems. In some plantings the larvae are causing more injury than the adults.

Mississippi. C. Lyle (July 23): The striped cucumber beetle was attacking watermelons at Poplarville and in Grenada, Yalobusha, and Lafayette Counties during this month. This insect was also reported attacking cucumbers at McAdams.

MELON APHID (Aphis gossypii Glov.)

Minnesota. K. A. Kirkpatrick (July 15): Aphids are showing up in a very general and serious infestation on melon and cucumber at Minneapolis, Hennepin County. Some fields of cucumbers are reported to be practically killed.

South Dakota. H. C. Severin (July 23): The cucumber aphid was abundant early in July in Brookings County. Ordinarily we begin to receive complaints about this pest early in August.

PICKLEWORM (Diaphania nitidalis Stoll)

Mississippi. H. Gladney (July 23): The pickleworm was causing serious injury to cantaloups in two localities in Harrison County.

SQUASH

SQUASH BUG (Anasa tristis Deg.)

New York. N. Y. State Coll. Agr. News Letter (July 6): Squash bugs have ruined several fields of squash in Niagara County. (July 26): The squash bug has been abundant in all the fields visited in Nassau County.

Virginia. C. R. Willey (July 12): Was called out to tell a farmer at Mechanicsville how to get rid of bugs that were killing watermelon vines. The squash bugs had moved from summer squash onto a 5-acre patch of watermelons. They were present by thousands and had ruined about 1 acre, a solid block adjacent to the squash. Were scattering and occurring in spots over the rest of the melon patch. A few adults were present but most were nymphs from one-third to one-half grown. Handfuls of cast skins were seen around dead vines.

Missouri. L. Haseman (July 24): This pest is attracting some attention, though no more than usual in July.

Tennessee. L. B. Scott (July 16): The squash bug has appeared in more than normal numbers. Many plantings are being completely destroyed in Montgomery County.

Alabama. J. M. Robinson (July 21): The squash bug was reported as abundant on watermelon vines at Montevallo on July 15.

Mississippi. C. Lyle (July 23): This insect was damaging squash and watermelon at Europa on June 30.

Louisiana. C. O. Eddy (July): The squash bug has been abundant during the last month.

Utah. G. F. Knowlton (July 1): Squash bugs are active throughout northern Utah being about normally abundant.

Utah and Nevada. E. H. Davis (July 16): In southeastern Utah and southern Nevada the squash bug is thick on all melons and cucumbers. Cantaloups are dying rapidly; the squash bug killing the vines.

California. J. Wilcox (July 17): Bugs were present at Riverside in all stages in the 12-acre field and had killed about 5 percent of the vines and part of about 10 percent of the others.

SQUASH BORER (*Melittia satyriniformis* Hbn.)

New York. N. Y. State Coll. Agr. News Letter (July 12): At Geneva, Ontario County, the squash vine borer started to appear on June 29 and it is still present in the field and laying eggs.

South Carolina. C. O. Bare (July 15): About 60 vines in a garden planting in Windermere, Charleston County, were found to be badly damaged and bearing little fruit. As many as five moths were seen ovipositing at the same time.

Tennessee. L. B. Scott (July 15): The squash borer is found in approximately normal numbers in Montgomery County.

CELERY

TARNISHED PLANT BUG (*Lygus pratensis* L.)

New York. N. Y. State Coll. Agr. News Letter (July 12): In Niagara County the tarnished plant bugs are showing a little injury on muck celery. (July 26): The plant bug was repeating rapidly the first of the week. (July 19): Throughout Orange County plant bug injury on celery is general.

R. W. Leiby (July 19): In Wayne and Orleans Counties typical injury is being done to muck-grown celery. Injury seems to be more pronounced than usual.

CARROT RUST FLY (*Psila rosae* F.)

New York. N. Y. State Coll. Agr. News Letter (July 26): In Orange County injury to early set celery in the field has been unusually serious in some sections. A few blocks of early carrots have been almost completely ruined.

ONIONS

ONION THRIPS (*Thrips tabaci* Lind.)

Connecticut. N. Turner (July 21): Thrips and blight killed set onions at Southington early in July. Thrips have been unusually abundant and seed onions are showing serious injury from them.

New York. N. Y. State Coll. Agr. News Letter (June 28): In Wayne County onions show a rather high infestation of thrips. (July 19): The onion thrips have practically destroyed the bunching onions in all parts of Nassau County. (July 26): In Orange County the population is building up very rapidly and will cause considerable injury in some sections.

Nebraska. D. B. Whelan (July 22): Onion thrips were numerous at Lincoln early in July.

California. R. E. Campbell (August 2): A quotation from the July 31 issue of the California Cooperative Crop Reporting Service says: "The late onion crop in the Delta Section is very spotted. Thrips has been particularly bad on the later plantings and it is doubtful whether some of the acreage will warrant harvesting at present prices, because of the small size of the onions."

ONION MAGGOT (Hylemyia antiqua Meig.)

New York. N. Y. State Coll. Agr. News Letter (June 28): In Saratoga County rather heavy loss has been experienced for the first time in several years. Onion maggots on bunch onions are more serious than usual in Monroe County.

Idaho. J. R. Douglass (July 15): Have recieved numerous complaints about onion maggots destroying stands of onions in Twin Falls.

YELLOW-NECKED CATERPILLAR (Datana ministra Drury)

New York. N. Y. State Coll. Agr. News Letter (June 28): In Wayne County the yellow-necked Datana worms were found feeding on onions in several places in one field.

SWEET CORN

CORN EAR WORM (Heliothis obsoleta F.)

Connecticut. N. Turner (July 21): About 5 percent of the extra early corn in southern Connecticut was infested. Larvae have already left the corn.

New York. N. Y. State Coll. Agr. News Letter (July 26): In Nassau County there is an unusually heavy infestation in all varieties of sweet corn. (August 2): In Westchester County this pest is causing considerable trouble and damage to sweet corn. Granite Springs and Yorktown have about 1,250 acres, about 1 quarter of which is infested.

Virginia. G. E. Matheny (August 2): Serious ear damage being caused by larvae in most plantings of sweet corn at Roanoke. (July 20): At Wytheville the pest is severe in some fields. Both sweet and field corn are being attacked, mostly at growing tips, base of tassel, and stalk.

A. M. Woodside (July 21): At Staunton the corn ear worm has been numerous on beans.

Georgia. T. L. Fissell (July 1): Very bad in sweet corn at the Experiment Station. Not yet in tomatoes in adjoining fields.

Indiana. E. V. Walter (July 16): Eggs are present on about a third of the ears of early sweet corn at Lafayette. Most first-brood larvae have matured and left the ears.

Alabama. J. M. Robinson (July 21): Adults are depositing eggs on late corn.

Utah. G. F. Knowlton (July 3): Corn ear worms are damaging ears and tassels of early sweet corn in parts of Davis County. At Woods Cross the larvae have damaged 2 percent of the tassels of early corn. (July 9): Of the earliest sweet corn now being harvested south of Farmington, 75 percent is infested; 25 percent of the worms have left the ears, apparently having matured; only 10 percent of the corn not yet ripe in the area is infested.

CORN FLEA BEETLE (Chaetocnema pulicaria Melsh.)

New York. N. Y. State Coll. Agr. News Letter (July 12): In Nassau County the corn flea beetle was found on July 4 on Staten Island on Golden Bantam corn. Present in abundance in most cornfields.

EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

New York. N. Y. State Coll. Agr. News Letter (August 2): In Albany County severe damage to sweet corn is apparent. At least one grower reported feeding 25 percent of his corn to hogs and selling another 10 percent of moderately infested ears. A few pupae were observed on July 26. Most of the worms were nearly full grown, although a few were only one-third grown.

ZEBRA CATERPILLAR (Manestra picta Harr.)

Indiana. J. J. Davis (July 26): The zebra caterpillar was reported abundant on garden sweet corn at Tipton on June 28.

Utah. G. F. Knowlton (June 30): Damaging alfalfa and sugar beets at Kanabville and peas at Ephraim.

STRAWBERRY

STRAWBERRY ROOT WEEVILS (Brachyrhinus spp.)

New York. N. Y. State Coll. Agr. News Letter (June 28): Strawberry root weevils, B. ovatus L., B. rufostriatus Goeze, and B. sulcatus F., have caused severe damage in a 2-year-old strawberry bed near Lycoming, Oswego County. Most of the population is composed of the first two species listed. Mostly pupae are present in the soil, although some adults and larvae can be found.

STRAWBERRY LEAF ROLLER (Ancylis comptana Froel.)

Kansas. H. R. Bryson (July 20): The second generation of the strawberry leaf roller reported more abundant in northeastern Kansas than it has been during the last 3 years; abundant also at Manhattan.

Utah. G. F. Knowlton (July 3): Strawberry leaf rollers are pupating, although from 75 to 90 percent still are larvae in Cache County. (July 17): Ninety-seven percent of the first generation are in the moth stage at Orem, Utah County. Parasitization is rather heavy.

SUGAR BEETS

FALSE CHINCH BUG (Nysius ericae Schill.)

- Oklahoma. F. A. Fenton (July 20): The false chinch bug has been reported as causing damage in Sayre and Grandfield, in southwestern Oklahoma.
- Texas. F. L. Thomas (July 23): More abundant than usual in northwestern Texas, damaging cotton in many counties the latter part of June.
- Idaho. C. Wakeland (July 21): The false chinch bug is reported as injuriously abundant on grain in the dry-farming district of Elmore County, in south-central Idaho.
- Utah. G. F. Knowlton (July 26): Very abundant in many parts of Sanpete and Sevier Counties. Damage to beets, garden plants, and sweetclover has been observed.
- Arizona. C. D. Lebert (July 21): During July we have had many calls regarding this pest. It has been coming in from vacant lots into yards and homes--few cases of severe injury to shrubbery.

BEET LEAFHOPPER (Eutettix tenellus Bak.)

- Utah. H. E. Dorst (July 28): Resistant beets in Sevier Valley show on the average about 30 percent of obvious cases of curly-top. Moderate damage in central Utah. Tomatoes in the Hooper district show about 40 percent with blight as the result of feeding of the beet leafhopper. Damage is much less in other parts of the State.

PARSNIP

PARSNIP WEBWORM (Depressaria heracliana Deg.)

- New York. N. Y. State Coll. Agr. News Letter (July 19): In Nassau County a severe infestation of the parsnip webworm was found in the Hicksville district, 90 percent of the plants showing injury.

TOBACCO

TOBACCO FLEA BEETLE (Epitrix parvula F.)

- Maryland. E. H. Cory (July 16): Present at Mt. Airy on tobacco.
- Florida. F. S. Chamberlin (July 5): Infestations are the heaviest in several years in Gadsden County.
- Tennessee. L. B. Scott (July 16): The tobacco flea beetle is present in approximately normal numbers in Montgomery County. Earlier in the season this species was found in less than normal numbers but the infestation is increasing slowly.

HORNWORMS (Protoparce spp.)

Florida. A. H. Madden (July 12): Larvae of P. sexta Johan. have been much less abundant in Gadsden County than normal. Scarcity appears to be due to the dry weather late in June and to the very efficient attacks of predaceous wasps, Polistes spp.

Tennessee. L. B. Scott (July 16): P. sexta and P. quinquemaculata Haw. are causing moderate damage in Montgomery County. Continued dry weather has delayed emergence. The infestation is approximately normal.

TBACCO BUDWORM (Heliothis virescens F.)

New York. N. Y. State Coll. Agr. News Letter (July 26): In Nassau County a worm tentatively identified by Dr. Carruth as the tobacco budworm has been feeding on corn and various grasses in the Hicksville and Wantagh areas. This week it was found to have completely destroyed about 1 acre of Chinese cabbage.

Florida. F. S. Chamberlin (July 12): The tobacco budworm is about normally abundant in Gadsden County.

AN APHID (Trifidaphis phascodii Pass.)

Connecticut. A. W. Morrill Jr. (July 6): Root aphid feeding on the roots of about a half an acre of sun-grown tobacco at Windsor. The field had previously been used as a pasture.

C O T T O N I N S E C T S

PINK BOLLWORM (Pectinophora gossypiella Saund.)

Texas. A. J. Chapman (July 10): Records made in 25 fields scattered over the Presidio Valley showed an average bloom infestation of 3.37 percent, as compared to 5.16 last year. In some fields planted early to the eastern varieties of cotton, good crops of bolls are already set, and most of this will escape injury.

BOLL WEEVIL (Anthonomus grandis Boh.)

South Carolina. F. F. Bondy (July 10): In the fields at Florence first-generation weevils are emerging in large numbers. (July 24): Weevils are becoming very numerous in many fields, some of which are bare of blooms. Reports from adjacent counties indicate that weevils are causing more damage than they have for years.

Georgia. T. L. Bissell (July 20): Larvae and adults are very scarce in central Georgia having been reduced by dry weather from a light infestation, which was present early in the month.

P. M. Gilmer (June 26): In the northern section of the State from Macon, or possibly Perry, north and east the infestation is heavy.

About Tifton, in southern Georgia, it is not yet serious enough to be doing any damage. The first new weevils emerged in the insectary at Tifton early in the week. (July 24): Upland cotton in southern Georgia has set a large crop of bolls, which are fairly well matured and past danger. Part of the Sea Island cotton failed to set early bolls, therefore most of it has a scarcity of well-grown bolls and is likely to suffer.

Florida. K. H. Smith (July 24): In Alachua County, northern Florida, square infestation in Sea Island fields under observation showed an average of 6.9 percent for the week ending July 3 and on July 24 an average of 27.5 percent.

Alabama. J. M. Robinson (July 21): Sufficiently abundant to warrant dusting in several localities in central-south Alabama. The infestation at Auburn is light, as compared with previous years.

Mississippi. E. W. Dunnam (July 17): In the Delta section (Washington County) boll weevils were increasing in infested areas very slowly, but spreading farther from hibernation quarters. There was some dusting, especially on the late cotton, but the earlier cotton is too far advanced for injury, and conditions on the whole are better than last season.

C. Lyle (July 23): The average infestation of the boll weevil for the month of July has been around 8 percent, being much higher in a few fields.

K. E. McCoy and J. E. Ragland (July 24): In Oktibbeha County, east central Mississippi, the infestation was increasing very slowly, the average being 5.7 percent, as compared with 4.4 percent on July 3. This was higher than during the same week in 1936 (1.93 percent) but very much lower than for the same week in 1935 (41.2 percent) and in 1934 (50.2 percent).

Miss. Weekly Cotton Insect Rpt. (July 26): Weevils were found on 82 farms, with an average infestation of $10\frac{1}{2}$ percent, as compared with 10 percent last week, 4 percent on this date last year, and 30 percent at the same time in 1935.

Louisiana. R. C. Gaines (July 3): Conditions during the last 2 weeks at Tallulah, in Madison Parish (Delta section) have been unfavorable for the multiplication of boll weevils. First generation weevils have been emerging for a week or 10 days but, owing to unfavorable conditions, the infestation has not increased as expected. (July 24): In some field cotton is fast reaching maturity. In field plots the infestation ranged from 5 to 32 percent, averaging 6 percent during the week.

C. O. Eddy (July): Boll weevil has increased its activities during the last half of the month, owing to rains.

Oklahoma. F. A. Fenton (July 20): Infestation continues to increase in the southeastern part of the State. In McCurtain County for the week ending July 17, the percentage of infestation in 11 fields sampled ranged from

3.4 to 25.8, with an average of 14.3 percent. In Choctaw County the infestation is serious in the bottoms, but in the uplands comparatively little damage will be caused.

Texas. K. P. Ewing (July 3): Infestation in Calhoun County increased during the week to an average of 23.12 percent, as compared to 10.7 percent the preceding week. In the Lavaca River bottom at Edna there was an average of 70.28 percent punctured squares. (July 24): Average infestation 70.49 percent. The maturity of the cotton combined with the high weevil infestation in all of this area, particularly in Calhoun and Jackson Counties, has caused the cotton to practically stop blooming in many fields. There was a noticeable migration into small cotton this week.

Prog. Rpt. Tex. Agr. Expt. Sta. (July 3): In general, boll weevils are causing far more damage in the coastal prairie section north of Corpus Christi than is realized. All cotton fields in the Lavaca River bottoms of Jackson County are being severely damaged where no control measures have been used. (July 10): The boll weevil infestation is increasing in southern and south-central Texas. (July 17): Average infestation records from eight counties in the State, ranging from Van Zandt and Smith in northern Texas to Dimmit and Calhoun in southern Texas, indicate that little damage is being caused in the northeast and the blackland areas of central Texas. The infestation reached a maximum of 40 percent on Brazos River bottom farms, and on upland farms the average increased from 35 to 42 percent during the last week, according to Bureau of Entomology and Plant Quarantine workers. (July 24): The boll weevil infestation in untreated fields of several counties averaged as follows: Calhoun, 28 percent; Jackson, 53 percent; Brazos, 40 percent; Burleson, 25 percent; Milan, 4 percent; Smith, 5 percent.

COTTON FLEA HOPPER (Psallus scriatus Reut.)

Georgia. P. M. Gilmer (June 26): Reports from Vienna, Unadilla, and Columbus, in the northern part of the State, indicate rather severe injury. At Tifton, in the southern part, the insect is present but has done no special damage. (July 17): The northern infestation seems to have declined sharply.

O. I. Snapp (July 1): The cotton flea hopper has damaged cotton near Fort Valley, in central Georgia.

Arkansas. D. Isely (July 24): There has been more injury by the cotton flea hopper this year than any year since 1926.

Oklahoma. F. A. Fenton (July 20): Damage to squares caused alarm in several widely scattered sections, notably in Sequoyah and Okfuskee Counties.

C. F. Stiles (July 22): Cotton flea hopper is occurring quite generally over the State but is decreasing in numbers.

Mississippi. C. Lyle (July 23): Was causing injury to cotton at Popo on June

29 and at Hernando on July 16. D. W. Grimes, of Durant, reports that damage is not so severe now as it was a few weeks ago.

E. W. Dunnam (July 24): In Washington County, in the east-central section, a few flea hoppers can be found but are causing very little damage.

Louisiana. La. Agr. Expt. Sta. Bug News (July 21): Abundant in the Red River Valley above Alexandria. New reports are now coming in on its activity below Alexandria and in the Lafayette and Breaux Bridge districts.

R. C. Gaines (July 24): In the Delta section, in Madison Parish, a few flea hoppers have been taken in the sweepings made each week, but the numbers do not indicate much damage to cotton.

B. A. Osterberger and M. B. Christian (July): Cotton flea hopper seriously injuring cotton in several parishes, mostly along Red River from Natchitoches Parish to Avoyelles Parish.

Texas. K. P. Ewing (July 10): During the last 2 weeks there has been a marked decrease in the flea hopper infestation in Calhoun County. (July 24): In the young cotton flea hopper infestation continues sufficiently high to cause nearly all squares to be blasted.

R. W. Moreland (July 17): In Brazos and Burleson Counties the infestations have been very light in upland cotton fields. On July 10 some dusting was being done in the bottom fields.

Tex. Agr. Expt. Sta. Prog. Rpt. (July 17): Flea hoppers are in small numbers and causing practically no damage, except in northern and northwestern Texas. J. R. Quinby states that this insect is responsible for the loss of from three to five small squares each on 90 percent of the plants of May-planted cotton in Hardeman County. In Dickens County the average infestation in 11 fields is 100 flea hoppers to 100 buds, with a maximum of 222 flea hoppers. (July 24): Flea hoppers have decreased in northern Texas but have increased on young cotton in southern Texas. They are reported as causing damage in Donley, Wheeler, Dickens, and Hardeman Counties, northwestern Texas.

COTTON LEAF WORM (Alabama argillacea Hbn.)

Georgia. W. L. Lowry (July 22): On July 22 one half-grown larva was collected on Sea Island cotton in Lowndes County. On July 24 one larva two-thirds grown was found at Valdosta.

Florida. K. H. Smith and J. T. Roy (July 6): Pupae of the leaf worm were collected on Sea Island cotton today near Alachua and McIntosh. As these fields are some 45 miles distant, this indicates that the leaf worm may be scattered over the northeastern part of the State. (July 19): In a 40-acre field near Alachua leaf worms were found in sufficient numbers to be ragging the cotton in spots. As many as 25 worms were found on a

single plant, ranging from tiny threadlike worms a day or so old to pupae.

Florida. W. E. Conn (July 12): Light infestations in 2 acres of cultivated cotton at Miami and some larvae now entering into pupal stage.

Alabama. H. C. Young (July 13): At Florala, in the southern part of the State, larvae about half grown were found in one field.

Texas. J. C. Gaines (July 10): Leaf worms were found at College Station this week.

K. P. Ewing (July 24): The infestation in Calhoun County in the Gulf coast section is very spotted.

Tex. Agr. Expt. Sta. Prog. Rpt. (July 24): Leaf worms have been reported in west-central Texas. Their appearance near San Angelo, in Tom Green County, is from 2 to 3 weeks earlier than usual and may indicate an earlier invasion of northwestern Texas. Worms collected in south-central Texas have been found to be heavily parasitized for this time of year. (July 31): Have caused comparatively little injury to date. They were found last week in Reeves County. The recent hot, dry weather in central Texas tended to cause the newly matured moths to fly a greater distance, even though uninfested cotton is near.

Arizona. W. A. Stevenson (July 24): At Fresno, Pima County, a very light infestation was discovered on July 23. The first infestation in 1936 was found on August 12.

BOLLWORM (Heliothis obsoleta F.)

Georgia. P. M. Gilmer and W. L. Lowry (July 24): From time to time a certain amount of damage has been observed in many fields of cotton, but thus far the damage is relatively small.

Mississippi. K. E. McCoy and J. E. Ragland (July 24): Slight damage has been noticed in several fields.

Louisiana. R. C. Gaines (July 9): At Tallulah a few bollworms were observed on cotton last week.

Texas. R. W. Moreland (July 17): At College Station cotton was found to have an average of 9.9 eggs per 100 terminals. At one point 84 eggs per 100 terminals were counted.

Tex. Agr. Expt. Sta. Prog. Rpt. (July 24): Eggs have increased in bottom-land fields and young worms are beginning to feed on the forms of succulent plants. No infestation has appeared in upland fields. An average of 15 eggs and a maximum of 84 per 100 plants has been found in 10 fields of the bottom lands in Brazos and Burleson County.

K. P. Ewing (July 24): Practically no bollworm damage was noticed at Edna or Port Lavaca.

COTTON APHID (Aphis gossypii Glov.)

South Carolina. F. F. Bondy (July 24): In Florence County one field that had been poisoned showed a heavy aphid infestation.

Georgia. T. L. Bissell (July 20): Aphids are numerous at Experiment on the growing points of cotton but do not seem to be harmful.

W. L. Lowry (July 24): With the advent of hot weather, cotton aphids seem to have disappeared almost entirely in Lowndes and Echols Counties.

Mississippi. G. L. Bond (July 23): Several fields of cotton at Moss Point heavily infested with the cotton aphid during the last 10 days.

E. W. Dunnam (July 24): Aphid population increasing in one field in Washington County.

Texas. K. P. Ewing (July 24): In Calhoun County aphids have caused practically no damage in any of the dusted cotton.

TARNISHED PLANT BUG (Lygus pratensis L.)

Tennessee. D. M. Simpson (July 8): In 1935 we practically had a crop failure, owing to damage from tarnished plant bugs. We have a heavy infestation of these insects again around Knoxville and a large percentage of the plants are practically devoid of squares. The insects are abundant in nearby fields of soybeans and lespedeza, also in weeds and grass. On a recent visit to western Tennessee several farms were visited in Fayette County near Somerville. On every farm damage similar to that at Knoxville was noted and tarnished plant bugs were found in the fields.

Louisiana. R. C. Gaines (July 24): Sweepings made in different cotton fields in Madison Parish during the last few weeks have shown only small numbers.

Oklahoma. F. A. Fenton (July 20): The tarnished plant bugs are injuring squares in several widely scattered sections of Oklahoma, notably in Sequoyah and Okfuskee Counties.

CONCHUELA (Chlorochroa ligata Say)

Texas. A. J. Chapman (July 17): Conchuelas are appearing in noticeable number in the fields at Presidio.

A CORN SILK BEETLE (Luperodes sp.)

Mississippi. Miss. Weekly Cotton Insect Rpt. (August 2): The most serious complaints of insect damage during the last week came from Noxubee County, where the corn silk beetle was reported causing severe injury to cotton squares and young bolls on many farms.

FOREST AND SHADE - TREE INSECTS

GYPSY MOTH (Porthetria dispar L.)

Maine. J. V. Schaffner, Jr. (July 16): N. Trafton reports defoliation of hundreds of acres of woodland in Kennebec, Sagadahoc, and Lincoln Counties. The infestation is the heaviest on record for these three counties. Defoliation was spotty and local in the northern part of York, southern Oxford, Androscoggin, and Cumberland Counties.

Portland Press Herald (June 29): Officials of the State department of agriculture report the worst gypsy moth scourge ever to sweep southwestern and central Maine. Occurrence of the moths in devastating numbers is reported as far as Kennebec and Knox Counties, and in less serious intensity eastward along the coastal counties to Washington County.

Massachusetts. J. V. Schaffner, Jr. (July 6): Thousands of acres of woodland in the eastern part of the State are completely defoliated. The defoliation within 25 or 30 miles of Boston is more extensive than it has been for many years.

A. I. Bourne (July 23): The defoliation this year was much more general and widespread than in any recent year. There are beginning to be many centers of rather serious defoliation just west of the Connecticut River. Throughout central and eastern Massachusetts are similar large areas of very serious foliage strippings; however, in the Cape district, from Buzzard's Bay to Provincetown, conditions are apparently better than for several years.

Rhode Island. A. E. Stene (July 23): Probably the most outstanding note regarding insect prevalence during the past month is the increase in gypsy moth infestation. We have had large areas heavily infested with this insect in the past, but there were a greater number of places involved during the past season and the aggregate area where defoliation has taken place is quite large.

Pennsylvania. A. F. Burgess (July 17): The interest of a former W.P.A. worker resulted in the discovery of a larval infestation near the Coolbaugh-Paradise Township line in Monroe County. This man, now employed by the Delaware, Lackawanna, & Western Railroad Company, observed an egg cluster of the gypsy moth while working along the railroad right-of-way and reported to the field supervisor in charge of that district. Numerous larvae have since been discovered in a rather restricted area. Intensive treatments will be applied in an effort to eradicate the infestation.

BROWN-TAIL MOTH (Nygmia phaeorrhoea Donovan.)

Maine. N. Trafton (July 26): Only a few larvae were seen this season and these were scattered through the towns of Bath, Hebron, Raymond,

Casco, Otisfield, and Paris.

SATIN MOTH (Stilpnotia salicis L.)

Maine. A. F. Burgess (June): Reports from the district inspector at Bangor in June indicated that defoliation was pronounced throughout his district. Shade and ornamental poplars showed the greatest injury.

N. Trafton (July 15): Severe local outbreaks in most of the towns in Androscoggin, Cumberland, Kennebec, Knox, Sagadahoc, Waldo, and York Counties, and also some in the southern parts of Franklin and Oxford Counties, and at Bangor, Brewer, Hernen, Oldtown, and Orono in Penobscot County.

New Hampshire. R. C. Brown (July 21): Abundant in the vicinity of Conway and Bartlett. Heavy feeding noticed on poplar shade trees.

FOREST TENT CATERPILLAR (Malacosoma disstria Hbn.)

New England. A. F. Burgess (June): A very heavy infestation in New Hampshire was reported by the district inspector at Keene. Complete defoliation of oak, maple, and birch has been noted in several Vermont sections. Defoliation of sugar maple orchards is reported as weakening the trees and threatening next winter's maple sugar crop. Reports received from the supervisory personnel in Vermont indicate that much damage is being done in certain sections. Feeding is also noticeable in limited areas in sections of Massachusetts and northwestern Connecticut.

Maine. N. Trafton (July 15): Many acres of woodland were severely defoliated in Cumberland, Oxford, and York Counties.

Vermont. J. V. Schaffner, Jr. (July 23): In Addison, Bennington, Orange, Rutland, Windham, and Windsor Counties infestation was heavy. Thousands of acres of maple sugar orchards and mixed hardwood forests were from 50 to 75 percent defoliated. The humid weather in the spring favored epidemics of disease and large numbers of the caterpillars while in the fifth and sixth instars succumbed to "wilt", thus reducing the infestation so that few trees were completely defoliated.

H. N. Bean (June 23): In Randolph, Royalton, and vicinities small areas of maple and birch were defoliated. Large areas of defoliation in town.

Minnesota. F. W. Forbes (June 20): Tent caterpillars reported very abundant at Bemidji, Beltrami County. (June 21): Tentless caterpillars reported moderately abundant at some points near the shore in Rosebush, Colvill, and Hovland Townships, as observed by county agent. Reported by State forest officers as very abundant at points on Gunflint Trail, inland. (July 12): Very abundant at McIntosh, Polk County, and in

some limited areas stripping the trees. (July 15): W. Kortcsnaki reports the caterpillars very abundant in St. Louis County at Embarrass. Complete defoliation in some areas.

CANKERWORMS (Geometridae)

New England. B.E.P.Q. News Letter (August): Examination of defoliated areas at the lower reaches of Penobscot River basin in Maine show 90 percent defoliation by cankerworms. Feeding is noticeable in limited areas in sections of Massachusetts and northwestern Connecticut.

Maine. N. Trafton (July 26): Prevalent at this season. Many shade trees and apple orchards, also hundreds of acres of woodland were defoliated this spring in the towns of Kennebunkport, Kennebunk, York, Wells, Biddeford, Saco, Old Orchard, Scarborough, Cape Elizabeth, Portland, South Portland, Westbrook, Falmouth, Cumberland, Yarmouth, Freeport, Brunswick, Bath, Woolwich, Boothbay, and Bristol. Also one heavy infestation noted in Oldtown.

Nebraska. M. H. Swenk (July 22): One of the most injurious outbreaks of the spring cankerworm (Paleacrita vernata Peck) in the history of the State occurred between May 21 and June 23 and involved all of southeastern Nebraska north to Douglas, Platte, Boone, and Custer Counties and west to Dawson and Harland Counties, with separate isolated local outbreaks in McPherson and Boyd Counties. Elm trees were the most severely attacked, including both American and Chinese elm. Apple trees were next most seriously attacked, and there were a few reports of damage to hackberry foliage.

MOURNING-CLOAK BUTTERFLY (Hamadryas antiopa L.)

Minnesota. R. C. Stephens (July 13): Strips Chinese elm and seems to die after weaving a web around the stems.

South Dakota. H. C. Severin (July 23): Caterpillars of the mourning-cloak butterfly are more abundant than usual; working chiefly on shade trees.

WHITE-MARKED TUSSOCK MOTH (Hemerocampa leucostigma S. & A.)

Ohio. E. W. Mendenhall (July 28): Quite serious on the elms and maples along the streets in Zanesville.

FALL WEBWORM (Hyphantria cunea Drury)

Maryland. E. N. Cory (July 9): General and numerous on poplar at Baltimore.

Alabama. J. M. Robinson (June 21): Active on pecans in southeastern Alabama.

Mississippi. C. Lyle (July 23): Reported fairly abundant in the Jackson, Poplarville, and Moss Point districts.

BAGWORM (Thyridopteryx ephemeraeformis Haw.)

Connecticut. E. P. Felt (July 23): Locally abundant at Stamford. A distinctly unusual condition for this area.

New York. E. P. Felt (July 23): Frequently reported about New York City.

Delaware. L. A. Stearns (July 23): Much more abundant than usual, frequent complaints being received from over the entire State. Attacking evergreens.

Maryland. E. N. Cory (July 26): Usual number of reports of evergreen bagworm.

Virginia. C. R. Willey (July): This pest occurring quite generally this season.

A. M. Woodside (July 21): Appears to be something like a general outbreak of bagworms on ornamental evergreens in vicinity of Staunton.

North Carolina. B. H. Wilford (July 30): Reported from Asheville. While the majority of cases were reported as damaging arborvitae, several other evergreen ornamentals were concerned. A number of individual trees have been completely defoliated.

South Carolina. W. J. Reid, Jr. (July 31): Specimens of the bagworm and injured branches of arborvitae received from Fort Moultrie. The damage to this ornamental on the reservation was reported to be severe.

Georgia. T. L. Bissell (July 5): Numerous and destructive on arborvitae and deodar cedar at Experiment. Worms apparently one-third grown.

C. H. Alden (July 15): Very injurious on several plantings of arborvitae at Cornelia.

Ohio. E. W. Mendenhall (July 28): Serious on elm trees in Zanesville and Springfield, especially on elms and maple trees planted along the streets.

Kentucky. M. L. Didlake (July 24): Unusually abundant on evergreens. Complaints from Lexington, Midway, Brownsville, Hodgenville, Vine Grove, Campbellsville, Mount Vernon, and Eubank.

Tennessee. G. M. Bentley (July 21): Reported in several places in the State on arborvitae and cedar.

L. B. Scott (July 16): More numerous than usual in northwestern Tennessee. Many reports of severe damage have been received from Montgomery County. Many ornamental cedars have been killed or seriously damaged.

B. H. Wilford (July 30): A light infestation by the bagworm on the red cedars on the Lebanon cedar forest near Lebanon was apparent early in July.

Alabama. J. M. Robinson (July 13): Reported as attacking evergreen at Birmingham.

Mississippi. C. Lyle (July 23): Reported abundant over most of the State during July.

ASH

A SPHINGID (Sphinx kalmiae A. & S.)

North Dakota. F. G. Butcher (July 19): Practically 100 percent foliage destruction to ash groves in the vicinity of Bismarck has been caused by larvae, probably S. kalmiae. These larvae are also being reported from other sections of the State where they are abundant feeding on corn and in vegetable gardens.

BIRCH

BIRCH SKELETONIZER (Bucculatrix canadensisella Chamb.)

New York. R. E. Horsey (July): Larvae were noted as early as July 2 and have become very numerous. The damage on several large planted river birches in Rochester is more severe and noticeable than I remember in previous years.

CATALPA

CATALPA SPHINX (Ceratonix catalpae Bdv.)

New Jersey. E. Kostal (July 12): Unsprayed trees in Morganville, Monmouth County, defoliated.

Ohio. E. W. Mendenhall (July 1): Infesting catalpa trees in Westerville. (July 14): Quite injurious in Rome.

Indiana. P. Luginbill (July 6): A number of catalpa trees near Lafayette have been defoliated. The larvae are now mature and leaving trees for pupation.

J. J. Davis (July 16): The catalpa worm is reported defoliating trees at Winamac.

Kentucky. M. L. Didlake (July 24): Catalpa sphinx abundant in various localities.

ELM

WOOLLY ELM APHID (Eriosoma americanum Riley)

Nebraska. M. H. Swenk (July 22): Next to the spring cankerworm in seriousness on the elm trees, if not equally so, was an outbreak of the woolly elm leaf aphid that began about May 27 and continued until June 28. This outbreak covered most of the State, from the southeastern corner north and west to Cedar, Holt, Dawes, Thomas, Perkins, and Redwillow Counties. Owing to the two pests, the elm trees in Nebraska suffered heavy damage to their foliage.

EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

New York. R. E. Horsey (July): Several noted the first part of July on American and European elms in Rochester.

Maryland. E. N. Cory (July 27): General on elm. Numerous reports. Seems to be on the increase.

Ohio. E. W. Mendenhall (July 25): Very injurious on the elm trees in Columbus.

Utah. G. F. Knowlton (July 1): Injury in Salt Lake City and at Provo.

ELM LEAF BEETLE (Galerucella xanthomelaena Schr.)

Vermont. J. V. Schaffner, Jr. (July 23): In the residential sections of Brandon and Middlebury the elm leaf beetles are abundant. The foliage on many large elms is brown from the feeding.

H. L. Bailey (July 26): Very abundant at Winooski, Chittenden County, in northwestern Vermont. Many elms nearly defoliated. First record of such serious damage by beetle north of Middlebury, Addison County, from which town, south to Massachusetts line, the beetle is irregularly abundant.

Connecticut. W. E. Britton (July 23): Injured trees are now conspicuous by their brown foliage, and have been observed in New Milford, Sharon, Cornwall, Danbury, Torrington, East Hartford, Gastonbury, and New Haven. Larvae, pupae, and adults have been received from Windsor Locks, and larvae from Manchester.

New York. R. E. Horsey (July): Grubs 1/4 inch long were noted on June 26 and were about through feeding by July 18. Very numerous and destructive this year on American, English, and Huntingdon elms.

E. P. Felt (July 23): Work is manifest in Hudson Valley.

Virginia. A. M. Woodside (July 21): Becoming injurious at Staunton.

C. R. Willey (July): About as usual in Richmond and south-side Virginia. Many trees are now defoliated, practically all larvae matured, and some adults out.

Ohio. E. W. Mendenhall (July 13): Very bad on elm trees in Springfield and Columbus. Trees are being defoliated. (July 26): Getting worse in Columbus, new sections being defoliated.

Kentucky. M. L. Didlake (July 24): Doing conspicuous damage to trees about Lexington.

Idaho. R. W. Ingele (July 26): Emerged much later than usual with infestations scattered and much lighter than for several years.

California. S. Lockwood (July 2): In Sacramento County most of the larvae have left the foliage and are now in the pupa stage at the base of the trees, with a freshly emerged adult being found occasionally.

HICKORY

HICKORY PHYLLOXERA (Phylloxera caryaecaulis Fitch)

New York. R. E. Horsey (July): Damage during the end of June and early July noted by the dropping of a large number of leaves from large hickory trees at Rochester. The black galls are very noticeable and numerous on the trees.

LOCUST

CARPENTER WORM (Prionoxystus robiniae Peck)

Maryland. E. N. Cory (July 7): Attacking locust at Solomons Island.

LOCUST LEAF MINER (Chalepus dorsalis Thunb.)

North Carolina and Tennessee. B. H. Wilford (July 30): The black locusts in the forested area of Madison, Yancey, Buncombe, and Henderson Counties in North Carolina and in the Greenbrier section of the Great Smoky Mountains National Park in Tennessee appear as though severely fire scorched. Damage is more pronounced than in 1935 and 1936.

LOCUST BORER (Cyrtene robiniae Forst.)

Kansas. H. R. Bryson (July 19): Causing injury to old locust trees at Lyndon.

MAPLE

COTTONY MAPLE SCALE (Pulvinaria vitis L.)

Indiana. J. J. Davis (July 26): Continues to be reported as abundant, in the northern third of the State. The first hatching of eggs observed on specimens sent from Shipshewana on June 26 and received at Lafayette on June 28. The eggs were hatching when received.

Illinois. W. P. Flint (July 21): Very abundant throughout the northern fourth of the State. More complaints of infestation have been received than at any time for the past several years.

OBLONG LEAF WEEVIL (Phyllobius oblongus L.)

Ohio. A. C. Davis (June 2): Feeding in the adult stage on the leaves of young willow, maple, and cottonwood in a nursery near Chardon, Geauga County. Average about 25 per tree. Damage was extensive, especially on young shoots. (Det. L. L. Buchanan.)

A EUCOSMID (Proteoteras aesculana Riley)

Michigan. E. I. McDaniel (July 2): A number of tender new twigs of maple and boxelder have been attacked by this small green worm that works down in the tender new growth. The species is unusually abundant this year.

Montana. H. B. Mills (July 22): A little terminal borer caused some injury to soft maple trees in Billings early in July.

GREEN-STRIPED MAPLE WORM (Anisota rubicunda F.)

Missouri. G. D. Jones (July 24): Heavy infestation. Stripping soft maples at Springfield, southwestern Missouri.

OAK

GOLDEN OAK SCALE (Asterolecanium variolosum Ratz.)

Rhode Island. E. P. Felt (July 23): Somewhat abundant on English oaks at Bristol and probably a major cause for the numerous dying twigs and branches.

A LEAF MINER (Neurobathra strigifinitella Clem.)

Maryland. R. A. St. George (July 12): A leaf miner injury on oak specimens from State Forest Nursery, College Park. (Det. C. Heinrich.)

A CYNIPID (Neuroterus minutus Bass.)

Massachusetts. E. P. Felt (July 23): The minute oak blister galls were so abundant on an oak in the Boston area as to seriously affect much of the foliage on the tree.

PINE

PINE NEEDLE SCALE (Chionaspis pinifoliae Fitch)

Mississippi. C. Lyle (July 23): The pine leaf scale was found at Durant.

Utah. G. F. Knowlton (July 1): Injury common at Logan and Salt Lake on pine and spruce.

BLACK TURPENTINE BEETLE (Dendroctonus terebrans Oliv.)

Mississippi. C. Lyle (July 23): Collected from pine on July 14.

SPRUCE BUDWORM (Cacoecia funiferana Glen.)

Michigan. E. I. McDaniel (July 19): An extensive area of jack pines has been defoliated in the vicinity of Negaunee. This area covers several thousand acres.

Minnesota. A. G. Ruggles (July 19): Spruce budworm is moderately abundant.

Colorado. J. A. Beal (June): A heavy infestation is occurring on ponderosa pine near Sugarloaf. An examination of the infested area showed the larvae to be very abundant over at least a section of forested land. On June 25 the larvae were tiny but had spun webs on nearly all the pine buds in the area examined. In some instances two or three larvae occupy a single bud. They are feeding on the needles and boring into them at the bases. This budworm probably represents a different strain than the one found infesting Douglas fir on other parts of the Roosevelt Forest. No sizable areas of infestation have previously occurred in pure stands of ponderosa pine. The present one threatens to become serious.

RED-HEADED PINE SAWFLY (Neodiprion lecontei Fitch)

Michigan. J. K. Kroeber (July 24): Sawfly larvae on jack and red pines now more numerous than ever noticed before. About half grown. Will probably result in killing one or more plantations on the Mackinac State Forest.

A SCARABID (Pachystethus obliqua Horn)

Michigan. L. E. Yeager (June): An outbreak of the pine chafer beetle, which has caused considerable alarm by its defoliation of jack pine on the Manistee National Forest in Michigan, is much less severe this year. This outbreak has been in progress since 1934 and, so far as known, this is the first period when the insect has occurred in destructive numbers. The beetles eat into the sides of the needles near the base, cut off some needles, and cause others to die. This gives the affected trees the appearance of having been scorched. Only the needles on the current season's growth are eaten but, after 2 or 3 years of attack, the trees begin to die in the tops, causing stag-head. Feeding tests with larvae do not indicate that the larvae feed to any extent on the roots of trees.

WHITE-PINE WEEVIL (Pissodes strobi Peck)

New England and New York. E. P. Felt (July 23): Has been somewhat injurious to leaders of white pine and also in spruce tips in southern New England and southeastern New York.

Connecticut. R. B. Friend (July 23): Much more abundant than last year at Windsor.

PINE BARK APHID (Pineus strobi Htg.)

New York. R. E. Horsey (July): Numerous and conspicuous on white pine the first part of the month at Rochester.

POPLAR

COTTONWOOD BORER (Plectrodera scalator F.)

Kansas. H. R. Bryson (July 27): Reported causing injury to trees at Leavenworth. Also plentiful on young cottonwoods along the Kaw River at Manhattan.

EUROPEAN SPRUCE SAWFLY (Diprion polytomum Htg.)

Vermont. H. L. Bailey (July 26): Larvae feeding on spruce at Wilmington, Windham County, south-central Vermont on June 30. Many trees dead from previous attacks, chiefly on margins of stands.

WALNUT

WALNUT CATERPILLAR (Datana integerrima G. & R.)

Virginia. W. J. Schoone (July 21): Several colonies have been seen on walnut. The caterpillars are more numerous than I have previously seen.

WILLOW

EUROPEAN WILLOW LEAF BEETLE (Plagioderma versicolora Laich)

New York. E. P. Felt (July 23): Generally abundant and injurious in southwestern New England and southeastern New York.

Connecticut. M. P. Zappe (July 22): Very many more than last year, especially along streams, in Fairfield County.

POPLAR AND WILLOW BORER (Cryptorhynchus lapathi L.)

Maryland. E. N. Cory (July 12): Attacking pussy willow at Cumberland.

INSECTS AFFECTING GREENHOUSE
AND ORNAMENTAL PLANTS

A SCARABAEID (Ataenius cognatus Lec.)

Massachusetts. A. I. Bourne (July 23): W. D. Whitcomb, of Waltham, reported rather heavy infestations in several large golf courses in eastern Massachusetts. This small scarab has destroyed several thousand square feet of turf on two large golf courses in Newton by eating the roots from the grass. Injured turf can be rolled back as when infested with the grubs of the Japanese beetle. Larvae, pupae, and, adults were present on July 14, pupae predominating.

HAIRY CHINCH BUG (Blissus hirtus Montd.)

Connecticut. W. E. Britton (July 23): Specimens received with reports of injury to lawns from Fanbury, New Haven, and West Haven.

New England and New York. E. P. Felt (July 23): The hairy chinch bug is locally abundant and quite injurious to lawns and golf courses in southwestern New England and southeastern New York.

PEAR SLUG (Eriocampoides linacina Retz.)

New York. R. E. Horsey (July 6): Numerous on mazzard cherry and cotton-easter at Rochester.

SOUTHERN PINE SAWYER (Monochamus titillator F.)

Virginia. C. R. Willey (July 23): On June 15 I collected an adult that was feeding on Chinese arborvitae in Fredericksburg. On June 21 a nurseryman from Petersburg brought in a specimen of hemlock damaged by the feeding of adults. He reported much damage being done in a newly developed section where many hemlocks were used in ornamental plantings. This pest has at times been numerous in Richmond, Newport News, and Norfolk. We have had no complaints except from Petersburg this year.

CHRYSANTHEMUM

CHRYSANTHEMUM LEAF MINER (Phytomyza chrysanthemi Kowarz)

Mississippi. C. Lyle (July 23): The chrysanthemum leaf miner was injuring verberna at Meridian on June 28.

DAHLIA

STALK BORER (Papaipema nebris nitela Guen.)

Ohio. E. W. Mendenhall. (Aug. 3): Stalk borers are injurious in dahlia plantations in Springfield.

A FLEA BEETLE (Systema elongata F.)

Georgia. T. L. Bissell (July 13): Feeding on surface of dahlia leaves at Experiment.

DELPHINIUM

CYCLAMEN MITE (Tarsonemus pallidus Banks)

Connecticut. W. E. Britton (July 23): Generally troublesome. Specimens received for identification, taken on larkspur from Riverside, Salisbury, and Woodbury.

EUONYMUS

EUONYMUS SCALE (Chionaspis euonymi Const.)

New York. R. E. Horsey (July): Euonymus at Rochester found to be badly infested. Some branches were white with the male scale. Moving young was found on July 20 and 21.

Maryland. E. N. Cory (July 2): Euonymus scale reported on bittersweet at Churchville, Harford County.

Mississippi. C. Lyle (July 23): The euonymus scale was observed in great numbers in several counties in northwestern Mississippi during the last few weeks.

GLADIOLUS

GLADIOLUS THRIPS (Taeniothrips simplex Morison)

Mississippi. M. L. Grimes (July 23): Thrips on several plantings of gladioli at Meridian.

SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata F.)

Ohio. E. W. Mendenhall (August 4): Injurious on gladioli in plantations at New Carlisle.

IVY

IVY SCALE (Aspidiotus hederac Vallot)

Ohio. E. W. Mendenhall (July 15): The ivy or oleander scale is quite bad on English ivy in some of the greenhouses in Springfield.

MEALY FLATA (Ormenis pruinosa Say)

New York. E. P. Felt (July 23): The mealy flata, or lightning leafhopper, was found in numbers on wistaria and English ivy at Cold Spring Harbor.

JUNIPER

AN APHID (Cinara sibericae Gill. & Palm.)

Virginia. R. A. St. George (July 7): On May 7 J. T. Palmer, of Arlington, submitted a specimen of tall juniper which was heavily infested with aphids. (Det. by P. W. Mason.)

JUNIPER SCALE (Diaspis carueli Targ.)

Connecticut. E. P. Felt (July 23): The juniper scale was reported to be abundant at Lakeville.

LILAC

LILAC LEAF MINER (Gracilaria syringella F.)

Vermont. H. L. Bailey (July 15): Lilac leaf miners unusually abundant at Montpelier, Washington County, central Vermont. Many leaves mined and curled up.

OYSTERSHELL SCALE (Lepidosaphes ulni L.)

New York. R. E. Horsey (July): Numerous on lilacs at Rochester. A 45-year-old shrub of the Amur lilac, 12 feet in height and spread, was found to have the twigs and branches completely covered with old and newly set scale, the worst infestation I have ever seen. About a third of the branches were dead. A tree lilac standing beside the infested one and almost touching it was free of scale. I have noted before lilacs free of scale next to badly infested ones.

LILAC BORER (Podosesia syringae Harr.)

New York. R. E. Horsey (July): The characteristic sawdust from this borer was noted at a few lilacs lately and a request for control information was received on July 16 from a Rochester resident, who said his lilacs had been badly damaged.

OLEANDER

OLEANDER CATERPILLAR (Syntomeida epialis Walk.)

Florida. J. R. Watson (July 23): The oleander caterpillar, exterminated by the freeze of December 12, 1934, has again appeared at Gainesville.

PHLOX

PHLOX PLANT BUG (Lopidea davisii Knight)

Indiana. J. J. Davis (July 17): Phlox plant bug is abundant and destructive to phlox at Rockport. All specimens received were nymphs.

RHODODENDRON

RHODODENDRON LACEBUG (Stephanitis rhododendri Horv.)

New York. R. E. Horsey (July 1): Winged adults quite numerous on rhododendron in Rochester.

ROSE

ROSE MIDGE (Dasyneura rodophaga Coq.)

Indiana. J. J. Davis (July 26): Rose midge was becoming very abundant and destructive in a greenhouse at Portland on June 23. A report from Indianapolis, dated July 14, advises us that this insect is becoming prevalent and destructive in rose gardens out of doors. This is the first report we have ever received of injury to out-door roses.

A ROSE STEM GIRDLER (Agrilus communis rubicola Perrin)

Michigan. E. I. McDaniel (July 13): The imported rose stem girdler has been found in a rose garden at Lansing. It has destroyed practically all rugosa roses and has become established on the hybrid species.

ROSE CURCULIO (Rhynchites bicolor F.)

Utah. G. F. Knowlton (June 30): Rose snout beetles are damaging roses at Holladay, Brigham, Salt Lake City, and Logan and are abundant on wild roses at Sardine, Canyon, Brigham Canyon, and Mill Creek.

INSECTS ATTACKING MAN AND
DOMESTIC ANIMALS

MAN

AMERICAN DOG TICK (Dermacentor variabilis Say)

Massachusetts. F. C. Bishopp (July 24): The American dog tick appeared to be declining rapidly in numbers on Cape Cod and Martha's Vineyard during the last 10 days.

Connecticut. W. E. Britton (July 23): Received one adult from Stratford.

CHIGGER (Trombicula irritans Riley)

Ohio. N. F. Howard (July 5-10): Chiggers are very abundant in the vicinity of Columbus, even present on city lawns.

Illinois. C. L. Metcalf (July 7): We are getting reports of an unusual abundance of chiggers from central Illinois.

Kentucky. M. L. Didlake (July 24): Chiggers in lawns at Morganfield and New Haven.

Missouri. L. Haseman (July 24): Some sections of the State reporting unusual annoyance from chiggers.

Tennessee. G. M. Bentley (July 21): The American chigger is unusually prevalent.

MOSQUITOES (Culicinae)

Delaware. G. H. Bradley (July 28): No outbreaks of consequence of the salt marsh mosquitoes Aedes salinarius Coq. and A. sollicitans Walk. have occurred along the Delaware and Maryland coasts up to July 25.

Maryland. E. W. Cory (July 20): Culex territans Walk. was sent in from Westover.

Missouri. L. Haseman (July 24): Throughout central Missouri during the month common mosquitoes have been very annoying, even in mid-day, in woods and shaded places.

Utah. G. F. Knowlton (July 5): Mosquitoes severely annoying to campers and picnickers in Logan Canyon.

A REDUVID (Triatoma protracta Unl.)

Colorado. R. G. Richmond (July 20): A few persons have reported attacks by this insect in Denver, resulting in slight fever, irritation, and some edema.

PUSS CATERPILLAR (Megalopyge opercularis S. & A.)

Louisiana. T. E. Snyder (July 9): Noted in New Orleans on roses and choke-cherry, and injuring humans.

EAR TICK (Ornithodoros megnini Duges)

Tennessee. G. M. Bentley (July 21): The spinose ear tick has been reported at one residence in Knoxville, owing to a badly infested dog. The ticks are occurring in the cracks of the walls and in and around the loose joints of shelving in cabinets.

CATTLE

SCREWORM (Cochliomyia americana C. & P.)

South and Southeast. W. E. Dove (July 30): For the 4-week period ended July 16, various counties in Georgia reported 327 cases as follows: Appling 2, Atkinson 1, Bacon 1, Brantley 3, Bulloch 5, Camden 4, Charlton 40, Chatham 2, Clinch 9, Coffee 3, Echols 2, Effingham 10, Glynn 6, Jeff Davis 2, Long 54, Lowndes 2, McIntosh 66, Mitchell 6, Pierce 2, Screven 2, Tattnall 2, Thomas 13, Ware 56, and Wayne 34. Almost half of all infestations continue to occur in the navels of late calves. In Florida for the 4-week period ended July 16, supervisors reported 2,669 infestations among 264,925 animals. In Louisiana specimens were identified from Leesville and reports of a few cases were received from Beauregard and Vernon Parishes.

Kansas. W. E. Dove (July 30): In Kansas a few cases were reported from Osage, Chase, Pottawatomie, and Chautauqua Counties.

Oklahoma. C. F. Stiles (July 22): Screwworms are showing up in large numbers. Jefferson County reports them as bad as in 1935. Two calves have been lost in Stephens County. Osage County reports serious outbreak. One case is also reported from Garfield County.

Texas. W. E. Dove (July 30): Stockmen in 73 counties reported on questionnaires for the month ended July 15 that 11,058 infestations occurred among 290,582 animals. In the principal sheep- and goat-breeding area reports from 26 counties gave 3,574 infestations among 152,800 animals. In the lower counties of the State 1,623 cases were reported among 25,004 animals. Supervisors reported 4,325 cases among 792,293 animals for the 4-week period ended July 16. Supervisors reconnoitered in 18 of these southern counties during the week ended July 23 and reported 2,440 infestations among 393,908 animals. Some counties in the Panhandle show tendencies toward localized outbreaks and a few cases are reported from counties in eastern Texas.

D. C. Farman (July 28): Catches from traps in the lower Rio Grande Valley from Catarina to Hebbronville and south, indicate C. americana present in about the same numbers as during the winter months. From this area north to Edwards escarpment adults built up until the first of

June. Since then there has been a gradual decrease over this area. The build-up at present in the traps is indicated from Fort Davis to Ozona, and is about 50 percent more than it was in the Gulf Plains area. The traps east of San Antonio do not indicate any considerable build-up to the first of July, but migration has been indicated to western Louisiana, where larvae were taken the first of July. Over the entire State infestations of C. americana have been practically normal. The northern limit in Texas and Oklahoma at present appears to be about the central Panhandle in Texas and the central and southern parts of Oklahoma. The migration north was not quite so rapid during June and July as it was last year.

New Mexico. W. E. Dove (July 30): In New Mexico 607 cases were reported among 143,156 animals.

Arizona. D. C. Parman (July 28): Records indicate that C. americana has completed migration across the southern desert area and is established on the escarpments at Wickenburg. To the present the build-up has not been very considerable at any point but the areas in southeastern Arizona, about Nogales, Fairbanks, and Douglass, indicate appreciable build-up, being 10 percent as high as the infestation in west-central Texas.

W. E. Dove (July 30): From 17,329 animals, 33 infestations were reported.

STABLEFLY (Stomoxys calcitrans L.)

Maryland. G. H. Bradley (July 28): Stableflies were quite troublesome in the vicinity of Ocean City in the early part of July.

Iowa. F. C. Bishopp (July 6): In traveling across Iowa and eastern Nebraska I found much evidence of stablefly attack on livestock. Cattle and horses were observed bunched together and fighting vigorously.

Missouri. L. Haseman (July 24): Stableflies very abundant during the month.

HORN FLY (Haematobia irritans L.)

Missouri. L. Haseman (July 24): Horn flies very abundant during the month.

Colorado. F. C. Bishopp (June 30): Horn flies are relatively scarce at Colorado Springs. On several herds observed there were about 30 to 50 flies per animal.

HORSES

BOTFLIES (Gastrophilus spp.)

Colorado. F. C. Bishopp (July 4): Three horses were examined at Virginia Dale for eggs. Each showed a very light infestation of G. nasalis L. No adult activity was observed. The horses were entirely free of G. intestinalis Deg. On July 3 several horses along the highway 4 miles

north, near the Wyoming line, were being greatly annoyed by G. haemorrhoidalis L. Some ranchmen in this vicinity report not having observed any attacks this year, which indicates that adult activity has started only recently.

HOUSEHOLD AND STORED-PRODUCTS INSECTS

TERMITES (Rectulitermes sp.)

Kentucky. M. L. Didlake (July 24): Complaints from Nicholasville, Harrodsburg, and Bethlehem.

Kansas. H. R. Bryson (July 22): Besides the usual number of requests regarding the control of termites in houses, some correspondents have reported termite injury to living shade trees. This condition no doubt has been brought about by exceptionally dry soil conditions and, as a result, the termites have been attracted to watered trees or living trees.

ARGENTINE ANT (Iridomyrmex humilis Mayr)

Alabama. J. M. Robinson (July 21): The Argentine ant is active in many parts of the State.

Mississippi. C. Lyle (July 23): Argentine ants received from a correspondent at Quentin on July 8.

A LEAF-CUTTING ANT (Atta texana Buckl.)

Louisiana. T. E. Snyder (August 4): At De Ridder, in Beauregard Parish, this ant was found attacking lettuce and peas and carrying grain from storehouses. Ordinarily it is a serious pest in pine plantations in winter and spring.

RED HARVESTER ANT (Pogonomyrmex barbatus F. Smith)

Oklahoma. F. A. Fenton (July 20): The red harvester ant was the subject of inquiries from Thomas and Leon.

HOUSE CRICKET (Gryllus domesticus L.)

Connecticut. W. E. Britton (July): Several dwelling houses in Hartford infested. They are near a dump, which may be the source of infestation.

A FLOWER BEETLE (Tribolium madens Charpentier)

Minnesota. H. H. Shepard (July 15): One specimen was found in a sample of wood shavings used as insulation in the walls of a house at Montevideo.

A HAIRY FUNGUS BEETLE (Typhaea fumata L.)

Massachusetts. A. I. Bourne (July 23): On June 4 a barn at Groton was found to be heavily infested with this beetle. The infestation apparently started in milled hay. When infestation was discovered and the hay was removed, millions of beetles swarmed over the building.

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SPREAD OF ALFALFA WEEVIL IN 1937

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Because of its conflict with other seasonal activities, scouting for the alfalfa weevil during 1937 was again necessarily limited largely to areas that could be visited incidentally in connection with other research work. The scope of this season's scouting is shown in table 1, which shows discovery of previously unreported infestations in five counties, namely, Campbell, Johnson, Sheridan, and Weston, in northeastern Wyoming, and Custer County, in southwestern South Dakota. Details of this scouting are included in table 2. A limited amount of sweeping was also performed in counties hitherto found to be infested, with the results shown in table 3.

Table 1.--Summary of scouting for alfalfa weevil, 1937

State	Counties ¹	
	Scouted	Where weevil was found
	Number	Number
Colorado-----	14	0
Nebraska-----	3	0
New Mexico-----	5	0
Oregon-----	1	0
South Dakota---	5	1/1
Washington-----	3	0
Wyoming-----	7	2/4

¹/ Custer.

²/ Campbell, Johnson, Sheridan, and Weston.

Table 2.--Detailed results of alfalfa weevil scouting, 1937

State	County	Fields Swept	Total sheeps	Weevil		Fields infested
				Larva	Adult	
		Number	Number	Number	Number	Number
Colorado 1/-----	Adams	2	1,000	0	0	-
	Crowley	5	1,500	0	0	-
	Douglas	2	1,000	0	0	-
	El Paso	1	500	0	0	-
	Huerfano	3	1,500	0	0	-
	La Plata	13	6,500	0	0	-
	Las Animas	1	500	0	0	-
	Logan	3	1,500	0	0	-
	Morgan	5	2,500	0	0	-
	Otero	2	1,000	0	0	-
	Pueblo	5	2,500	0	0	-
	San Miguel	1	200	0	0	-
	Washington	1	500	0	0	-
	Weld	10	5,000	0	0	-
Nebraska-----	Banner	3	1,500	0	0	-
	Kimball	2	1,000	0	0	-
	Morrill	3	1,500	0	0	-
New Mexico-----	Colfax	1	500	0	0	-
	Rio Arriba	3	1,500	0	0	-
	San Juan	6	3,000	0	0	-
	Sante Fe	1	500	0	0	-
	Taos	2	1,000	0	0	-
Oregon-----	Umatilla	6	3,750	0	0	-
South Dakota---	Butte	1	500	0	0	-
	Custer	7	3,650	4	0	2
	Lawrence	6	3,000	0	0	-
	Minne	3	1,500	0	0	-
	Pennington	3	1,500	0	0	-
Washington-----	Benton	10	5,150	0	0	-
	Walla Walla	7	5,300	0	0	-
	Yakima	17	9,000	0	0	-
Wyoming-----	Albany	1	500	0	0	-
	Campbell	3	1,200	7	0	1
	Crook	3	1,500	0	0	-
	Johnson	1	200	8	0	1
	Laramie	1	500	0	0	-
	Sheridan	6	2,400	5/ 8	0	3
	Weston	2	20	175	2	2

- 1/ J. H. Newton, deputy State entomologist of Colorado, scouted the following following counties with negative results: Adams, Alamosa, Archuleta, Bent, Boulder, Chaffee, Clear Creek, Conejos, Crowley, Dolores, Douglas, El Paso, Fremont, Gilpin, Grand, Jackson, Jefferson, La Plata, Larimer, Logan, Mineral, Morgan, Otero, Park, Pitkin, Pueblo, Rio Grande, Saguache, Summit, Teller, and Weld.
- 2/ C. L. Corkins, State entomologist of Wyoming, reports that he and J. H. Newton swept 16 fields (6,400 sweeps) in Albany County with negative results.
- 3/ Estimated.

Table 3.--Sweeping alfalfa fields in counties previously reported infested by alfalfa weevil (1937)

State	County	Fields	Sweeps	Result
		Number	Number	
Colorado 1/----	Montezuma	12	8,000	Weevil not found
	Ouray	1	15	Weevil found
Nebraska 2/----	Box Butte	5	4,200	Weevil not found
	Dawes	3	1,150	Weevil found
Nevada-----	Clark	33	22,700	Weevil not found
South Dakota---	Fall River	6	2,075	Weevil found
Wyoming 3/----	Goshute	2	200	Do.
	Niobrara	3	1,400	Weevil not found

- 1/ J. H. Newton, Colorado deputy State entomologist, reports having found the weevil in Eagle County and having failed to find it in Montezuma County.
- 2/ L. M. Gates, entomologist, Nebraska department of agriculture and inspection, reports that in Scotts Bluff County 14 fields were examined (2,800 sweeps) and 5 were found infested; 200 sweeps in ? Sioux County fields revealed both fields infested; no weevils were found in 1,950 sweeps made in 6 fields in Box Butte County; 1 of 4 fields (2,100 sweeps) in Dawes County 1 field was found infested.
- 3/ C. L. Corkins, Wyoming State entomologist, reports that he and J. H. Newton failed to find the weevil in Carbon County in 7,600 sweeps made in 19 fields.

THE MORE IMPORTANT RECORDS FOR AUGUST

Grasshoppers continued to be the major entomological feature in the Plains and Rocky Mountain States. Second-brood Melanoplus mexicanus Sauss. are appearing generally in Missouri, Nebraska, and the adjoining States.

Egg laying of the Mormon cricket is well advanced or completed in the Great Basin.

The Gulf wireworm was found 112 miles north of the Gulf coast in Mississippi during the month while the sugar beet wireworm was more abundant in Ventura County, Calif., than ever before recorded.

A survey indicates that the white-fringed beetle is lightly infesting about a thousand acres in Jones County, Miss. The infested area in Walton County, Fla., has been found to be somewhat wider than heretofore known.

The variegated cutworm did considerable damage to tomatoes, celery, and other truck crops in Indiana and Michigan.

An outbreak of the garden webworm occurred early in the month in eastern Nebraska, principal damage being done to alfalfa. A very heavy flight of the moths was observed late in the month in Oklahoma.

The hessian fly survey carried on in the West Central States indicates that the fly is at the lowest population level ever recorded.

Heavy losses of late sweet corn and tomatoes by the corn ear worm were reported in the Middle Atlantic and East Central States.

The European corn borer was reported in destructive numbers in Connecticut, Vermont, and New Jersey and on the Eastern Shore of Virginia.

A very heavy population of the potato leafhopper was reported from the East Central States, damaging alfalfa and potatoes. Infestation on potato was so heavy in Wisconsin that practically all fields were brown before the third week of the month.

Peak flights of adult codling moths were reported in the upper Hudson River Valley on August 3; in Delaware on August 11; in Knox County, Ind., on

August 21; in Michigan on August 16; and in Wisconsin on August 15.

First adult of the second brood of plum curculio appeared in Maine on August 20. In Georgia 69 percent of the females started to deposit eggs by August 20.

Heavy infestations of the grape leafhopper were reported from northern Indiana and Ohio.

The walnut caterpillar was very prevalent in southern New England, Middle Atlantic, and East Central States, and southwestward to Oklahoma.

False chinch bug is generally prevalent from Kansas to New Mexico and Nevada.

Very heavy populations of squash bugs were reported to be seriously damaging many cucurbitaceous plants in New York, Virginia, Iowa, Missouri, Nebraska, and Utah.

A rapid increase of boll weevil was reported in the South Atlantic States and in southeastern Texas; however, the season is well advanced and much cotton already made.

The cotton leaf worm has been reported more abundant in Florida than at any time since 1912. The insect was generally reported in small numbers over the greater part of the Cotton Belt.

Cotton flea hopper injury was in general, very low throughout the Cotton Belt.

Heavy losses of cotton in the Imperial Valley, caused by the outbreak of the cotton leaf perforator, occurred during the first 3 weeks in August. The insect was also reported from Arizona.

Fall webworm outbreaks, in some cases of considerable intensity were reported from the North Central, Middle Atlantic, South Atlantic, East Central and Gulf States.

Elms in the New England States were seriously browned by the elm lacebug. This insect was also reported as damaging elms in Florida.

Thousands of acres of forest in Maine have been defoliated by the European spruce sawfly.

A detailed report on screwworm infestation will be found in this number of the Survey Bulletin.

An unusually severe infestation of stableflies is reported from the North Central States.

Brain fever of horses, transmitted by mosquitoes, has become so serious in the North Central States as to glut the market with dead animals at rendering plants.

GENERAL FEEDERS

Grasshoppers (Acrididae)

Indiana. J. J. Davis (August 23): During the past month reports of damage, mostly to garden crops, were received from many different localities. In many sections grasshoppers have been and continue to be very abundant in grassy and weedy areas with much less attack and injury to crops than their numbers would lead one to anticipate. Apparently this condition is due to the continued succulent vegetation in the breeding places, preventing the need of migrating to cultivated crops. The hoppers were most abundant in northwestern and northern Indiana; also in the central-western region east to beyond Lafayette, and in Wells County in northeastern Indiana where the hoppers were damaging young grass as well as garden crops.

C. Benton and W. B. Noble (August 13-24): Adults abundant in many localities of Benton, Tippecanoe, Clinton, and Tipton Counties. Some damage to corn leaves and ears in occasional fields in outside portions next to fence rows, especially in Benton County.

Kentucky. M. L. Didlake (August 24): Grasshoppers of several species, among them Melanoplus differentialis Thos. and Dissosteira carolina L., attacked corn at Eddyville; tobacco, sweetpotatoes, peas, and beans at Bowling Green; and Lespedeza sericea at Water Valley.

Minnesota. A. G. Ruggles (August): Grasshoppers are very abundant in the southern third of the State.

Iowa. H. E. Jaques (August): Grasshoppers are from moderately to very abundant throughout the State.

Missouri. L. Haseman (August 21): Hoppers continue to be abundant especially over most of the western and northern parts of the State. The two-lined hoppers (M. bivittatus Say) are practically gone. M. differentialis is mating and females are carrying mature eggs. The red-legged hopper (M. femur-rubrum Deg.), in central Missouri, is very scarce, while M. mexicanus Sauss. is apparently largely, if not entirely, in the second brood and in places very abundant. Most of them are in the second to fourth instar with a few adults. Carolina locust (D. carolina) was never so abundant as at the present time. The adults are present in swarms on all bare spots or cultivated patches.

Nebraska. M. H. Swenk (August 20): Grasshoppers continue to be the major crop pest. Over 15,000 tons of bait materials have been used. Where the bait has been freely and properly applied the grasshoppers have been brought under control and much of the corn crop has been protected from serious damage. The damage that has taken place is spotted and irregular in distribution, and mostly in areas where the population was exceedingly heavy or control measures inadequate, or both. In the fall of 1935 there was a small and much localized hatching of

M. mexicanus in southeastern Nebraska; late in July 1936 there was a much larger and more widely distributed hatch of this species; and beginning the last week in July of this year, and continuing through August to date, there has been a large and important hatching of this species involving the entire State, but much heavier in the eastern part than in the west. This second hatching of this species is playing a very important role in the late season control program. No second hatching of M. bivittatus or M. differentialis has been observed. An interesting phase of the situation, though not of great economic importance, is the unusual abundance of the lubber grasshopper (Brachystola magna Gir.).

Kansas. H. R. Bryson (August 24): Grasshoppers are not causing as much injury as they were last year at this time. A trip from Manhattan to Jewell County through Riley, Clay, Cloud, Mitchell, Jewell, and Washington Counties revealed the fact that the greater part of this year's injury could not be attributed wholly to the large population of hoppers but rather to the small amount of green vegetation on which to feed. The greater part of the acreage in these counties had been prepared for wheat, forcing the grasshoppers to seek food elsewhere. Pastures likewise offer very little vegetation for the hoppers. The greatest injury observed was in alfalfa fields. Injury to corn silks has been more prevalent than ever reported before.

Oklahoma. F. E. Whithead (August 20): Grasshoppers in the fields are definitely on the decline. Presumably owing to extremely hot, dry weather, the grasshoppers largely left the alfalfa and cotton fields and are present in weeds, underbrush, along fence rows, and in draws. M. differentialis remains the predominating species.

C. F. Stiles (August 24): Grasshoppers continue to do some damage throughout the central and western part of the State. Prevailing species are M. mexicanus, M. differentialis, and M. bivittatus.

Utah. C. J. Sorenson (August 22): M. bivittatus, M. packardii Scudd., M. femur-rubrum, and M. mexicanus are very abundant in southwest and northwest Cache County.

G. F. Knowlton (August 24): Grasshoppers are damaging ripening tomato fruits in many localities of Davis, Box Elder, and Weber Counties. Large numbers are winged in all areas at this time.

Nevada. G. G. Schweis (August 25): Grasshoppers have moved in from waste lands to cultivated crops in Douglas County, necessitating control. The species involved are Camula pellucida Scudd., M. mexicanus, and Oedaleonotus onigma Scudd.

MORMON CRICKET (Anabrus simplex Hald.)

Nebraska. M. H. Swank (August 20): A specimen of Mormon cricket was sent in from Grant County, in west-central Nebraska, on August 9, with the statement that the insect is quite numerous in that locality.

Wyoming. Salt Lake Tribune (August 22): There are billions of crickets in those portions of the Yellowstone National Park where tourists seldom visit.

Nevada. G. G. Schweis (August 25): The egg survey for Mormon crickets in Elko, Humboldt, Eureka, and Lander Counties has been completed for the year and the number of eggs indicates that there will be a heavy infestation over a wide area next year.

WIREWORMS (Elateridae)

Mississippi. K. L. Cockerham (August 9): One adult, Heteroderes laurentii Guer., was found August 9 by J. P. Kislanko at Laurel, Jones County. This is a new locality record and extends the spread 112 miles north from the Gulf coast.

California. R. E. Campbell (July 23): Quoting M. D. Miller, Assistant agricultural agent, Ventura County: "Wireworm damage in Ventura County has been more widespread and severe than any of the oldest inhabitants can recollect. Farms which have never been previously infested show a surprisingly heavy damage this year."

A WHITE GRUB (Phyllophaga aphelida Say)

Maryland. E. N. Cory (August 6): May beetles are severely injurious in Queen Annes, Talbot, and Saint Marys Counties.

GREEN JUNE BEETLE (Cotinis nitida L.)

Georgia. O. I. Snapp (August 1): The green June beetle is unusually abundant at Fort Valley, central Georgia, feeding on ripe peaches. Many fruits were ruined.

T. L. Bissell (August 9): Green June beetles have been swarming in abundance for the last 2 days at Griffin. They evidently emerged after showers on August 7, which had followed a dry period. Beetles fly over grass and up into trees as long as the sun shines. I have never before seen such a flight of this species. Individual beetles have been out some weeks.

Kentucky. M. L. Dillake (August 24): Green June beetles destructive to peaches in Lexington.

JAPANESE BEETLE (Popillia japonica Newm.)

New England and New York. E. P. Felt (August 14): The Japanese beetle has increased greatly in southwestern New England and southeastern New York and has been found in some numbers in several localities in the southern Berkshires of Massachusetts.

Connecticut. W. E. Britton (August 21): The Japanese beetle is gradually becoming more prevalent. It is present in all the cities and larger

villages of the State, but is not yet found throughout the open country districts. Heavy infestations occur in Branford, Bridgeport, Darien, Greenwich, Hartford, New Canaan, New Haven, New London, Putnam, Ridgefield, and Stamford.

New York. N. Y. State Coll. Agr. News Letter (August 16): Japanese beetle has been troublesome in sections of Westchester County where it has never been before.

Delaware. L. A. Stearns (August 24): Infestation for the present year about ended; but few beetles now in evidence except on especially susceptible hosts.

ASIATIC GARDEN BEETLE (Autoserica castanea Arrow)

Connecticut. W. E. Britton (August 21): This beetle is rapidly becoming more prevalent in Connecticut. During the past month adults have been received from Darien, Greenwich, Hamden, and Norton, and three lots from New Haven.

WHITE-FRINGED WEEVIL (Naupactus leucoloma Boh.)

Florida. J. R. Watson (August 23): Extensive scouting in Walton County has resulted in somewhat widening the known infested area.

Mississippi. C. Lyle (August 24): The first specimens of the white-fringed beetle in Mississippi were sent to this office from Laurel on August 6. Inspectors have found that about 1,000 acres in Jones County are lightly infested. The infestation is largely confined to the city limits of Laurel, and so far it has not been found in the farming district.

CUTWORMS (Noctuidae)

Indiana. J. J. Davis (August 23): During the month considerable damage in central Indiana was observed by the yellow-striped armyworm (Prodenia ornithogalli Guen.) and the variegated cutworm (Lycophotia margaritosa squalia Hbn.) eating into the green fruits of tomato. In all cases coming under our observation the infestations occurred along borders of fields or in fields which were grassy and weedy. What was apparently the variegated cutworm was reported eating into the heads of cabbage August 10 at Berne.

Michigan. R. Hutson (August 17): The variegated cutworm attacked celery in the vicinity of Inlay City during the first week of August. The infestation embraced practically the entire celery-growing district in that vicinity, but the cutworm did not occur in other celery-growing districts.

Nebraska. M. H. Swenk (August 20): A Gage County correspondent reported the yellow-striped armyworm to be present on his flowers on July 26.

Arizona. C. D. Lebert (August 13): During the last of July and the first of August in the East Verde area, northeast of Payson, there was a rather

heavy infestation of the armyworm (Cirphis unipuncta Haw.) and the variegated cutworm. They were working together on alfalfa, garden crops, and young fruit trees. Rather severe damage was observed.

California. A. E. Michelbacher (August 13): In certain scattered localities through central California the yellow-striped armyworm (Prodenia praefica Grote) has caused some damage to the developing fruit.

FALL ARMYWORM (Laphygma frugiperda S. & A.)

Georgia. T. L. Bissell (August 17): Worms are found shredding the leaves of young corn at Griffin, central Georgia. This is the first injury noticed this year.

VELVETBEAN CATERPILLAR (Anticarsia gemmatilis Hbn.)

Florida. J. R. Watson (August 23): Peanuts in Alachua County have in many cases been severely attacked by the velvetbean caterpillar.

Louisiana. B. A. Osterberger (August 25): We have records of activity from Napoleonville to Franklin, Crowley, Baton Rouge, and Hammond. The present generation is developing rapidly and moths for the next generation are beginning to emerge and lay eggs.

GARDEN WEBWORM (Loxostege similalis Guen.)

Nebraska. M. H. Swenk (August 20): The large flights of moths occurring at Lincoln in mid-July resulted in an outbreak of webworms during the week of July 28 to August 3. This outbreak was most severe in Richardson County, where damage was done in the alfalfa fields and armies of the webworms crawled into occupied houses. Damage was reported north as far as Butler, Madison, and Antelope Counties, chiefly in the alfalfa fields, but also in cornfields and pastures.

Oklahoma. C. F. Stiles (August 24): Sunday night I saw one of the heaviest flights of the moths that I have ever seen. Thousands were flying around the lights.

WHITE-LINED SPHINX (Sphinx lineata L.)

Wyoming. Margaret Greenwald (August 12): Moths common in alfalfa fields, feeding on the blossoms and on the blooms of bull thistle at Powell, northwestern Wyoming.

CEREAL AND FORAGE - CROP INSECTS

WHEAT AND OTHER SMALL GRAINS

ARMYWORM (Cirphis unipuncta Haw.)

Maine. J. H. Hawkins (August 7): Fields of oats and grass were seriously injured in central and north-central Maine. Oats were especially damaged, in some cases whole fields being destroyed or injured to such

an extent that they were not harvested.

Minnesota. K. A. Kirkepatrick (August 24): Armyworms have been quite abundant in several places in Hennepin County, one farmer reporting 30 percent loss on his grain.

Arizona. C. D. Lebert (August 13): During the last of July and the first of August in the East Verde area, northeast of Payson, there was a rather heavy infestation.

California. A. H. Clark (July): Specimens were sent from Los Angeles with the statement that moths occurred in thousands in a small home garden. (Det. by C. Heinrich.)

HESSIAN FLY (Phytophaga destructor Say)

General. J. R. Horton (June): A hessian fly survey conducted shortly before harvest last June indicates that the fly population has now reached its lowest general level in all the years of systematic record for the region comprising the States of Kansas, Missouri, Nebraska, and Oklahoma. At the present time infestation is, on the average, below the 10 percent level in all portions of these States. Maximum infestation in individual samples ranged from 40 percent downward to 24 percent and occurred in the southern and east-central portions of Missouri, particularly in Greene, Dallas, Scott, and Perry Counties and, in lesser degree, in Crawford, Osage, and Sainte Genevieve Counties. In other States no maxima worthy of special mention occurred, the highest individual-sample infestations being 18 and 22 percent in northeastern Kansas and southeastern Nebraska, respectively.

EUROPEAN WHEAT STEM SAWFLY (Cephus pygmaeus L.)

Ohio. E. J. Udine (July): Heavy infestations of the wheat sawfly in eastern Ohio. Actual damage by it was less than usual owing to a delayed development of the larvae which enabled harvesting to occur before the culms were severed.

CORN

CHINCH BUG (Blissus leucopterus Say)

Indiana. C. Benton and W. B. Noble (August 13-24): A survey in west-central Indiana covering 20 cornfields per county and 24 stalks per field showed the following average infestations of combined adults and nymphs:

County	: Average bugs per stalk	: Maximum bugs per stalk	1/
	Number		Number
Benton.....	2	:	75
Tippecanoe....	2	:	51
Clinton.....	1.5	:	50
Tipton.....	0.5	:	75

1/ In heaviest infested field.

The proportion of nymphs to adults increased from about 4 to 7 at the beginning of the survey to about 5 to 3 at the end. The majority of the nymphs belonged to the first three instars. Foxtail grass is abundant in some fields and moderately infested with nymphs.

Kansas. H. R. Bryson (August 24): Chinch bugs are scarce in Kansas.

Oklahoma. C. F. Stiles (August 24): Chinch bugs have also been reported in damaging numbers throughout the central part of the State. The infestation is very light on the western side of the State.

CORN EAR WORM (Heliothis obsoleta F.)

New York. N. Y. State Coll. Agr. News Letter (August 16): Many sweet corn growers are experiencing heavy losses in Westchester County.

New Jersey. E. Kostal (August 25): This species is very seriously damaging late sweet corn in Morganville, Monmouth County.

Maryland. L. P. Ditman (August 23): Corn ear worm developed earlier this year than usual. Injury was especially heavy on tomatoes. Infestation fell off during the latter part of July and first of August, but it became severe during the past 10 days.

Ohio. T. H. Parks (August 26): While injury was very severe to early maturing sweet corn and to early tomatoes, its presence in mid-season corn is not much above average. We look for a heavy infestation in late sweet corn.

Indiana. J. J. Davis (August 23): The second brood has been very abundant, attacking corn, but the infestation in tomatoes by this brood has been negligible except where they adjoin cornfields. The third brood is just appearing and is showing up slightly more on tomatoes than the second brood.

E. V. Walter and C. Benton (August 13-24): Infestations in sweet corn at Lafayette have been from 20 to 50 percent, with the majority of worms nearly full grown. Infestations in field corn averaged 10 to 20 percent.

Illinois. W. P. Flint (August 23): To date the corn ear worm has been only moderately abundant, though a heavy late brood is developing.

Missouri. L. Haseman (August 21): While most fields of corn show heavy infestation, sweet corn at Columbia is much less severely infested than one might have expected from the severe infestation in the tassels of corn earlier and in early tomatoes. At present very few worms are showing up in tomatoes in central Missouri.

Utah. G. F. Knowlton (August 24): Moths are found in small numbers at trap lights in northern Utah. Damage to sweet corn is rather heavy in northern Utah.

Nevada. G. G. Schweis (August 25): Damage to sweet corn seems to be decidedly less than a year ago.

EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

Vermont. H. L. Bailey (August 20): For the first time in Vermont borers have been found in considerable numbers in potato stalks in Rutland and Chittenden Counties. Many larvae apparently full grown at Ira, Rutland County, southwestern Vermont.

Connecticut. W. E. Britton (August 23): Larvae of the second generation are now very prevalent in the New Haven region and cause much damage to the ears of sweet corn and the shoots and buds of dahlias.

New Jersey. E. Kostal (August 25): This species is very seriously damaging late sweet corn at Morganville, Monmouth County.

Virginia. H. C. Walker and L. D. Anderson (August 28): This has been a very favorable year for the development of the European corn borer on the Eastern Shore of Virginia. The second generation of borers has done considerable damage in some fields of early corn. One stalk was dissected which contained 30 full-grown larvae or pupae. Moths of the third generation are now in flight and over 350 eggs have been counted on some plants. A great many plants in a field of corn near Onley have over 100 eggs now and eggs are still being deposited.

Italy. H. D. Smith (July 30): Our Italian field assistant reports very heavy infestation of corn borer in the Province of Mantova, heaviest in years. About every plant infested. Corn exceptionally early this year.

SOUTHERN CORN ROOTWORM (Diabrotica duodecimpunctata F.)

Indiana. J. J. Davis (August 23): Since our report a month ago, records of injury to corn reported from the Northwestern quarter of the State. No reports received since August 1.

C. Benton and W. B. Noble (August 13-24): Adults of D. duodecimpunctata are unusually abundant everywhere on corn in Benton, Tippecanoe, Clinton, and Tipton Counties, mostly behind the leaf sheaths and in the silk. In Benton County D. longicornis Say was abundant and largely replaced D. 12-punctata.

Kentucky. M. L. Dillake (August 24): Southern corn rootworm damaged corn in central Kentucky.

Missouri. L. Hosman (August 21): During August they have been very abundant in central Missouri. These are the adults from the rootworms which were so destructive during July, especially in the central part of the State.

CORN LANTERN FLY (Perognathus malidis Asm.)

Florida. J. R. Watson (August 23): The corn lantern fly about ruined late-planted corn in Alachua and other counties.

ALFALFA

ALFALFA WEEVIL (Hypera postica Gyll.)

California. A. E. Michelbacher (August 13): In the San Joaquin Valley on August 11 the highest average number of larvae collected to the 100 sweeps of an insect net was 23, while the adult count was 17. At Pleasanton no larvae or adults were collected while in the San Francisco Bay area the highest larval count to the 100 sweeps was 28.

POTATO LEAFHOPPER (Emponasca fabae Harr.)

Ohio. E. W. Mendenhall (August 12): The County agent of Guernsey County reports severe damage to alfalfa. Entire fields have been ruined.

Indiana. J. J. Davis (August 23): The past 2 months have witnessed one of the most destructive attacks on alfalfa that we have observed since our earliest records over 20 years ago. The infestation was general throughout the State. The observations reported last month indicated much greater injury in the southern half of the State.

Kentucky. M. L. Dilake (August 24): Destructive to alfalfa in central and western Kentucky.

ALFALFA CATERPILLAR (Eurymus eurytheme Bdv.)

Arizona. C. D. Lebert (August 13): In the Salt River Valley near Phoenix, Mesa, and Gilbert there has been severe injury to alfalfa by the alfalfa caterpillar. Some fields in the Mesa-Gilbert area are almost completely defoliated. Thousands of the butterflies have been seen in the valley. Every tourist coming through the valley is carrying a display on the radiator of his motor car.

PLANT BUGS (Lygus spp.)

Utah. C. J. Sorenson (August 22): L. elisus Van D. and L. elisus hesperus Knight are very abundant in alfalfa fields throughout the State.

VETCH

VETCH BRUCHID (Bruchus brachialis Fabricius)

South Carolina. W. C. Nettles (August 23): A serious infestation of vetch seed reported from York County (central), a new county in our list for the insect.

SUGARCANE

SUGARCANE BORER (Diatraea saccharalis F.)

Louisiana. B. A. Osterberger and A. L. Dugas (August 20): Infestation in the Teche section of the sugar belt in southern Louisiana is light with the exception of a few isolated heavily infested areas. Many of the eggs collected were heavily parasitized with Trichogramma.

RICE

SUGARCANE BEETLE (Euetheola rugiceps Lec.)

Louisiana. W. A. Douglas (August 21): Injury to rice is rather serious. After water has been drained from fields the beetles go in and gnaw the stalks at or just beneath the surface of the soil. Farmers have been forced to cut rice before it was mature. In some fields 28 percent of the stalks are being gnawed. This has not only reduced the yields but has prevented maturity of some of the rice that will be threshed and lowered the grade on account of chalkiness.

B. A. Osterberger (August 18): Last night on the main business street of Baton Rouge several adults were noticed flying around show-window lights.

FRUIT INSECTS

SHOT-HOLE BORER (Scolytus rugulosus Ratz.)

Ohio. T. H. Parks (August 26): Following serious defoliation of cherry trees by cherry leaf spot, shot-hole borers are causing more inquiries than usual from all parts of the State.

Indiana. J. J. Davis (August 23): Damage to apricot reported from Anderson on August 10.

Georgia. O. I. Snapp (August 20): The shot-hole borer is rather scarce at Fort Valley, owing in part, to the removal of neglected and abandoned orchards and to the better care of orchards.

A LEAF-FOOTED BUG (Leptoglossus clypealis Heid.)

Nebraska. M. H. Swenk (August 20): Reported to be working on currants in Sioux County on August 16 and on wild plums in Hooker County on August 18. This is the first report of damage by this species.

PEAR SLUG (Eriocampoides limacina Retz.)

Nevada. G. G. Schweis (August 25): Pear slugs are damaging pear and cherry trees near Reno.

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

New York. N. Y. State Coll. Agr. News Letter (August 15): Showers the past week have slowed up second-brood activity in Niagara County. In the lake zone but few eggs could be found on pears and very few fresh entrances. Wormy fruit on the ground and stings around the lower parts of the trees also show that the tops are being missed. In Wayne County occasional

second-brood entrances are beginning to show up but are still hard to find. An occasional late sting is showing up in some orchards in Orange County, but the injury is not great enough to necessitate special applications by growers.

D. W. Hamilton (August 24): At Poughkeepsie peak activity of first-brood moths, as indicated by bait traps, occurred on the night of August 3. Moths continued to appear in bait traps until August 21. Since then the temperature has been too low for moth activity. Bands examined on August 16 had very few pupae present. Commercial orchards appear to have a lighter infestation than a year ago.

Delaware. L. A. Stearns (August 24): Second-brood injury general and about average for this date. Peak flights of first-brood moths, possibly second-brood moths, were recorded on the nights of July 13, 16, and 25, and August 11.

Virginia. A. M. Woodside (August 23): At Staunton bait-pail catches reached a rather high point a month ago, and have continued high since, with minor fluctuations. The infestation of fruit is about the same as at this date last season.

Georgia. C. H. Alden (August 23): Most of the larvae now leaving the fruit are going into hibernation at Cornelia. There is very little moth emergence or egg deposition. The trees are well fruited and well-sprayed orchards are exceptionally free of injury.

Indiana. L. F. Steiner (August 25): As indicated by bait-trap captures, second-brood adult activity reached its peak in three orchards in Knox County (southwestern Indiana) on August 21, 2 days later than in 1936. Although the second brood caused severe damage in many orchards, a higher percentage than usual of larvae are hibernating, therefore the third brood is expected to be less destructive than normal.

Illinois. W. P. Flint (August 23): The third brood is just beginning to hatch in southern Illinois. The late second brood is still abundant in the central part of the State. On the whole, this insect will cause more damage than it did in 1936.

Kentucky. M. L. Didlake (August 24): Codling moth is unusually abundant over the State.

Michigan. R. Hutson (August 21): Second-brood codling moth reached its first peak during the period July 23 to August 3. Heavy flight of moths took place on August 16 and 17.

Wisconsin. C. L. Fluke (August 23): Second brood more active than for many years in Wisconsin. Bait traps caught a greater number at Gays Mills (Crawford County) than have been caught since the laboratory was established in 1929. First peak at Gays Mills on August 1; maximum peak, August 15. At Sturgeon Bay (Door County) first peak on August 14.

Minnesota. K. A. Kirkpatrick (August 24): Moderately abundant.

Missouri. L. Haseman (August 21): The broods have been very much upset, probably owing to the peculiar weather when the moths from overwintering larvae were emerging. Whereas normally second-brood moths emerge in July, this year they continued to emerge until about the middle of August, thus overlapping with early third-brood moths. Second-brood larvae have been especially noticeable in central Missouri since about August 10. We may have only a partial third-brood of moths and larvae though in northwestern Missouri third-brood moths have been emerging in increasing numbers since August 15.

Nevada. G. G. Schweis (August 25): Injury to apples and pears is prevalent in Washoe County.

YELLOW-NECKED CATERPILLAR (Datana ministra Drury)

New Jersey. E. Kostal (August 25): This species is more prevalent than at any time during the last 4 years. Damage is moderate to severe at Morganville, Monmouth County.

Ohio. E. W. Mendenhall (August 18): Trees are nearly defoliated in an apple orchard north of Zanesville.

RED-HUMPED CATERPILLAR (Schizura concinna S. & A.)

Michigan. R. Hutson (August 21): Reported from Lansing and Dunbar.

FLATHEADED APPLE TREE BROER (Chrysobothris femorata Oliv.)

Indiana. J. J. Davis (August 23): Destructive to quince trees at Evansville on August 18.

Nebraska. M. H. Swank (August 20): Complaints of damage to fruit and shade trees continue to be received.

Kansas. H. R. Bryson (August 24): Borers continue to cause injury to weakened trees and shrubs.

Oklahoma. F. E. Whithead (August 20): Numerous reports are still coming in concerning injury. The adult population has declined during the month and is now very low.

ROUNDHEADED APPLE TREE BORER (Saperda candida F.)

Missouri. L. Haseman (August 21): Abundant and the larvae are about one-fourth grown but not doing the damage they did a year or two ago.

BUFFALO TREEHOPPER- (Cerisa bubalus F.)

Michigan. R. Hutson (August 21): The buffalo treehopper began depositing eggs August 1 in the vicinity of Coloma, Eau Claire, and Watervliet.

APPLE MAGGOT (Rhagoletis pomonella Walsh)

Connecticut. P. Gannan (August 20): Early fruit seriously infested in some orchards in New Haven County.

New York. N. Y. State Coll. Agr. News Letter (August 16): Considerable apple maggot showing up in Orange County.

PEACH

PLUM CURCULIO (Conotrachelus nemophor Hbst.)

Maine. F. H. Lathrop (August): At Monmouth, Kennebec County, larvae were found dropping peaches in large numbers during the latter half of July. The numbers decreased greatly after the first week in August. The first adults of the new brood appeared in cages August 20. Damage to fruit in commercial apple orchards is now pronounced than usual.

Georgia. O. I. Snow (August 20): The infestation continues lighter than that of an average year at Fort Valley. Adults are scarce in most orchards. Sixty-nine percent of the first-generation females have started to deposit second-generation eggs, which is more than usual.

O. H. Alden (August 23): No emergence of second-generation beetles to date in insectary cages at Carolina.

Missouri. L. Haseman (August 21): At Columbia between August 10 and 20 plums have been infested with larvae, probably second-brood larvae, as most first-brood larvae are normally out of fruits by July 15.

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Virginia. A. M. Woodside (August 23): Infestation of fruit has been high at Staunton.

South Carolina. C. L. Cartwright (August 23): Somewhat worse than usual on the peach crop recently harvested.

Georgia. O. I. Snow (August 1): Of 3,984 Elberta peaches carefully examined this year, not one was found to be infested.

Mississippi. C. Lyle (August 24): Larvae were found in Photinia twigs at Jackson on July 30. Injured peach twigs have been received from Blue Mountain, Charleston, and Gautier, and from the Darkest and Middle districts.

Kentucky. M. L. Dislake (August 2): Injury less noticeable than in recent years.

PEACH BORER (Carmenta ciliata Say)

Georgia. O. I. Snow (August 23): The work of a peach

has just occurred in Fort Valley, central Georgia, which is about the normal time. The infestation is moderate.

Kentucky. M. L. Didlake (August 24): Destructive at Louisville and Centertown.

LESSER PEACH BORER (Synanthedon pictipes G. & R.)

Georgia. O. I. Sharp (August 20): Fall-brood moths are depositing eggs at Fort Valley, central Georgia.

PEACH TWIG BORER (Anarsia lineatella Zell.)

Utah. C. J. Sorenson (August 22): Peach twig borer moderately abundant in Utah and Davis Counties on peach fruit.

CHERRY

UGLY-NEST CATERPILLAR (Cacoecia cerasivorana Fitch)

Maryland. E. M. Cory (July 31): Several reports from Garrett County recently of browning of wild cherry foliage. Specimens from shad bush proved to be the ugly nest.

A SAWFLY (Neurotoma fasciata Nort.)

West Virginia. L. M. Peairs (August 13): Specimens of larvae from cherry received for identification. They make a large webbed nest which accumulates much frass. They are very numerous in several sections, mainly high locations, on Prunus serotina. Numerous in Preston and Monongalia Counties.

RASPBERRY

ROSE SCALE (Aulacaspis rosae Bouche)

Indiana. J. J. Davis (August 23): Reported destructively abundant on raspberry at Indianapolis July 28.

GRAPE

GRAPE LEAFHOPPER (Erythroneura comes Say)

Ohio. T. H. Parks (August 26): More abundant than usual. Some growers, who in previous years have not found it necessary to spray for leafhoppers, have been doing so this year.

Indiana. J. J. Davis (August 23): Has been reported destructively abundant from all parts of the State, especially from the northern half.

Mississippi. C. Lyle (August 24): The grape leafhopper was found on grapes at Greenwood during the month.

Utah. G. F. Knowlton (August 24): Damage to Virginia creeper and certain varieties of grapes is very severe in many localities.

California. C. S. Morley, Kern County Monthly News Letter (August 6): Grape leafhoppers are doing considerable damage to grapevine.

GRAPE BERRY MOTH (Polychrosis viteana Cten.)

Delaware. L. A. Stearns (August 28): Less abundant than usual in Kent County.

New York. N. Y. State Coll. Agr. News Letter (August 16): In Orange County a little work of the larvae has been noted.

Michigan. R. Hutson (August 17): Grape berry moth is becoming noticeable in the vicinities of Paw Paw, Saint Joseph, and South Haven.

GRAPE SAWFLY (Erythraspides pygmaea Say)

Virginia. A. M. Woodside (August 23): Several colonies of larvae, probably E. pygmaea, have been observed on grape at Staunton.

GRAPE TOMATO GALL (Lasioptera vitis O. S.)

New York. E. P. Felt (August 14): Reported injuring grapevines at Farmingdale, Long Island.

: BLUEBERRY

BLUEBERRY MAGGOT (Rhagoletis pomonella Walsh)

New Jersey. E. Kostal (August 25): Infestation of native berries in bogs around Morganville is light and late in developing, possibly due to almost complete absence of the crop in 1935 and 1936. The crop this year is very heavy and the damage moderate.

: PECAN

PECAN NUT CASEBEARER (Acrobasis caryae Grote)

Texas. C. B. Nickels (August 14): Extensive counts made in six orchards in central Texas indicate that the first generation destroyed approximately 30 percent of the pecan crop. Many nuts dropped before infestation counts were made. We estimate that at least 40 percent of the pecan crop was destroyed by this insect.

PECAN WEEVIL (Curculio caryae Horn)

Georgia. T. L. Bissell (August 10): The pecan weevil is rather slow in emerging. Today we jarred three weevils from three trees that have been heavily infested in previous years at Milner.

EUROPEAN FRUIT LECANIUM (Lecanium corni Bouche)

Texas. C. B. Nickels (August 14): Widely distributed on pecan in central Texas. Infestation severe enough to cause economic injury has been observed on only a few trees.

WALNUT

WALNUT CATERPILLAR (Datana integerrima G. & R.)

Connecticut. W. E. Britton (August 23): Our attention has been called to the presence of this insect on black walnut and butternut in several places, and specimens have been received from Hamden and South Meriden.

New York. R. E. Horsey (August 13): Feeding on black walnut, along a road-side south of Rochester. Little damage.

New Jersey. E. Kostal (August 25): A few colonies noted for the first time in 3 years at Morganville. Damage moderate.

Ohio. E. W. Mendenhall (August 5): Many walnut trees are entirely defoliated in central Ohio.

Indiana. J. J. Davis (August 23): Have been reported abundant during the last month in many localities in northern Indiana.

Illinois. W. P. Flint (August 23): This insect has been more abundant in the State than in the last 2 years. The second brood is now in full swing over the central part of the State.

Michigan. R. Hutson (August 21): Reported from Dunbar.

Wisconsin. C. L. Fluke (August 23): More abundant this year than usual over most of the State; particularly numerous in the western counties.

Missouri. L. Haseman (August 21): A second brood has been hatching since about August 15 in central Missouri and some trees have one or more colonies on almost every limb, especially the lower limbs. This moth is usually single brooded, but a second brood has appeared this year.

Oklahoma. F. E. Whitehead (August 20): The first brood severely defoliated a high percentage of the pecan trees throughout most of the State. The second brood was very threatening 10 days ago but has failed thus far to develop in serious numbers.

CITRUS

COTTONY-CUSHION SCALE (Icerya purchasi Mask.)

Louisiana. I. J. Bechel (August 25): Light infestations were found on citrus trees near Triumph.

CITRUS WHITEFLY (Dialeurodes citri Ashm.)

Mississippi. C. Lyle (August 24): Reported on ornamentals at Meridian and Durant.

Louisiana. I. J. Boenel (August 25): Chinaberry trees in Plaquemines Parish are heavily infested. Nymphs are numerous on citrus trees throughout the parish.

CITRUS RUST MITE (Phyllocoptes olivorus Ashm.)

Florida. J. R. Watson (August 23): Somewhat more serious during the last 2 months than usual. This is probably correlated with the dry weather in June and July, which hindered the development of the entomogenous fungi.

Louisiana. I. J. Boenel (August 25): Light infestations in several groves near Buras.

Texas. N. C. Berry (August 7): Damage in the Rio Grande Valley is about normal. Good control is being obtained whenever spraying and dusting are practiced.

CAMPOR TREX

AVOCADO RED MITE (Paratetranychus yothersi McG.)

Florida. J. R. Watson (August 23): With the coming of more general rains in August the worst infestation we have known of the camphor red mite has largely subsided.

FIGS

BEEETLES (Coleoptera)

California. H. C. Donohue and G. H. Kelcey (July 19): The fallen first-crop mission figs at Fresno in the San Joaquin Valley were examined on July 11 and found to be heavily infested by adults of Hydrophilus pector Gsy. Other insects noted and recorded for the first time as feeding on fallen figs included: Oncomelania sericea Horn, Laemorhloeus ferrugineus Stål., and Typhaea fumata L.

TRUCK - CROP INSECTS

BLISTER BEETLES (Meloidae)

Connecticut. W. E. Britton (August 23): Unidentified blister beetles have been reported as injuring dahlia and aster in Colchester. Specimens of Epicauta marginata F., taken feeding on beet and spinach, were received from Milford.

Georgia. T. L. Bissell (August 10): At Milner, central Georgia, E. vittata F. is damaging a small patch of tomatoes by eating the foliage.

O. I. Shope (August 20): The striped blister beetle is abundant at Fort Valley, feeding especially on soybeans and pigweed.

Indiana. J. J. Davis (August 6): The black blister beetle (E. pennsylvanica Deg.) is reported damaging potato at Michigan City, in the extreme north-western part of the State.

G. E. Gould (August 24): Several species of blister beetles are unusually abundant and are stripping the foliage from potatoes, tomatoes, beets, and Swiss chard. The black blister beetle is causing much damage to flowers.

Illinois. W. P. Flint (August 23): Several species are very abundant in the central part of the State. They are so numerous that they will probably aid in controlling grasshoppers this fall.

Kentucky. M. L. Dillake (August 24): Blister beetles, E. marginata, E. vittata, and Macrobasis unicolor Kby., did widespread damage to tomatoes, beans, potatoes, and other garden crops and to alfalfa in western Kentucky.

Nebraska. M. H. Swank (August 20): Many reports of damage to garden plants, especially potato and tomato, were received, chiefly from Lancaster, Thayer, and Nuckolls Counties.

Kansas. H. R. Bryson (August 24): Blister beetles are causing the usual amount of damage. Garden crops suffer most.

Louisiana. B. A. Osterberger, L. O. Ellisor, and S. S. Sharp (August 20): In the vicinity of Jeenerette, southern Louisiana, E. vittata was found seriously injuring soybeans. In other sections it has been found on alfalfa, as well as on soybeans.

Utah. G. F. Knowlton (August 9): Black blister beetles are abundant and damaging alfalfa blossoms at Petersboro and Smithfield, in Cache County.

PALE-STRIPED FLEA BEETLE (Systema blanda Melsh.)

Kentucky. M. L. Dillake (August 24): Have caused considerable damage to seedling alfalfa in the Bluegrass Region during the first 2 weeks of August. Also common on potatoes and beans.

CARROT BEETLE (Ligyrus gibbosus Dej.)

Kansas. H. R. Bryson (August 24): Large numbers of beetles observed at lights during the last week. Observed killing marigolds in Jewell County.

FALSE CHINCH BUG (Nysius ericae Schill.)

Kansas. H. R. Bryson (August 24): Abundant at Coldwater, Ottawa, and Topeka.

Oklahoma. C. E. Stiles (August 24): Very numerous during the last month. Some complained that they came through the screens and were annoying at night.

New Mexico. W. B. Rogers (August 14): Has just recently been noted at Roswell. So far the damage has been light.

Utah. G. F. Knowlton (August 2): Abundant in many parts of Utah and reports of damage to garden crops have been received.

Nevada. G. G. Schweis (August 25): An outbreak was reported on grain in White Pine County.

TARNISHED PLANT BUG (Lygus pratensis L.)

Indiana. G. E. Gould (August 24): Moderately abundant on celery and potatoes grown on muck soil.

CHANGA (Scapteriscus vicinus Scudd.)

Florida. J. R. Watson (August 23): Causing damage to newly planted seedbeds in many parts of the State.

NORTHERN MOLE CRICKET (Gryllotalpa hexadactyla Parry)

Nebraska. M. H. Swank (August 20): Specimens were sent in from Dixon, Franklin, and Garden Counties.

POTATO AND TOMATO

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

Virginia. H. G. Walker and L. D. Anderson (August 28): A very heavy infestation occurred in several small home gardens in Norfolk during the latter part of July.

Utah. G. F. Knowlton (August 24): Populations have been light in the Hooper-Sunset area.

FLEA BEETLES (Epitrix spp.)

Vermont. H. L. Bailey (August 24): The puncturing of potato leaves by E.

cucumeris Harr. indicates greater abundance throughout the State than was reported in the last number of the Survey Bulletin.

Kentucky. M. L. Didlake (August 24): E. fuscula Crösch is injurious to second-crop potatoes.

Utah. G. F. Knowlton (August 24): Potato flea beetle injury has been less severe than it was in 1936.

CORN EAR WORM (Heliothis obsoleta F.)

South Carolina. F. Sherman (August 23): Worminess of tomato fruits has greatly decreased recently, in line with our repeated observations that it is worse in early season, before corn is in full silk.

California. A. E. Michelbacher (August 13): At present not a great deal of tomato fruit in middle-central California is infested. Harvest of the crop is just beginning. An examination of the green developing fruit in the different districts showed a range of from 0 to 8 percent in infestation.

HORNWORMS (Protoparce spp.)

Virginia. H. G. Walker and L. D. Anderson (August 28): In general the tomato hornworm has been rather scarce in most tomato fields around Norfolk, and on the Eastern Shore of Virginia, but at least one field of tomatoes near Norfolk was severely injured.

Indiana. J. J. Davis (August 23): Large green tomato worms have been unusually abundant in many sections of the State, not only defoliating plants but eating into fruits. The heaviest infestations were reported on August 7 in La Porte County, in the extreme northern end of the State.

Minnesota. G. B. Hildie (August 10): Hornworm, tobacco or tomato, moderately abundant.

California. A. E. Michelbacher (August 13): Hornworms are doing little damage to tomatoes. First-generation moths are emerging in large numbers and in the near future there may be an increase in damage.

STALK BORER (Papaipema nebris nitela Guen.)

Indiana. J. J. Davis (August 23): Reported damaging tomato plants at West Baden during the last month.

POTATO LEAFHOPPER (Empoasca fabae Harr.)

Vermont. H. L. Bailey (August 24): Less abundant than usual in most potato fields throughout the State.

Ohio. T. H. Parker (August 26): Have been more abundant than usual and in central Ohio have cut short the yield of late potatoes. Some plantings

showed the tops dead by mid-August.

Wisconsin. C. L. Fluke (August 21): Farmers in southeastern counties report that the leafhopper is so numerous as to be impossible to check with sprays. Nearly all fields brown at this date.

Tennessee. G. M. Bentley (August): Has been prevalent where Irish potatoes have been grown.

SLUGS (Mollusca)

Virginia. A. M. Woodside (August 23): Slugs are doing considerable damage to tomatoes in some local gardens of Staunton by rasping holes in the fruit which is near or in contact with the soil. In a few gardens practically all of the tomatoes were so damaged.

BEANS

MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

Georgia. O. I. Sharp (August 20): Increased rapidly during the last month at Fort Valley, central Georgia, and the infestation is nearly up to that of an average year.

T. L. Bissell (August 24): Numerous again and injuring young beans at Experiment.

Mississippi. C. Lyle (August 24): Destroying bean crops at Aberdeen and in counties farther north. (L. G. Goodgame): A report of this insect in Webster County was received from Eupora on August 17.

Arizona. C. D. Lebert (August 13): Reported damaging lima beans near Flagstaff.

Utah. G. F. Knowlton (August 10): County agent reports serious damage to beans in Carbon County.

A NOCTUID (Ogdoconta cinereola Guen.)

Michigan. R. Hutson (August 21): The striped bean caterpillar has been reported from Kaleva, in Meristee County, and from Arenac, Bay, Midland, and Saginaw Counties, where infestation is general.

LESSER CORNSTALK BORER (Elasmopalpus lignosellus Zell.)

Mississippi. C. Lyle (August 10): These insects are attacking beans at Booneville.

BEAN THRIPS (Heliothrips fasciatus Per.)

Utah. G. F. Knowlton (August 24): Causing moderate damage to beans in most fields in northern Utah.

Arizona. C. D. Lebert (August 13): We have a report from near Flagstaff of severe injury on beans. The leaves were curling badly and turning brown in an 80-acre field and some smaller fields.

CABBAGE

IMPORTED CABBAGE WORM (Ascia rapae L.)

Wisconsin. C. L. Fluke (August 23): The imported cabbage worm, the cabbage looper (Autographa brassicae Riley), and the diamondback moth (Plutella maculipennis Curt.) have been very destructive in southern and eastern Wisconsin. Owing to heavy parasitization, the damage was about over the third week in August.

Minnesota. A. G. Ruggles and assistants (August): Very abundant in east-central Minnesota.

Utah. G. F. Knowlton (August 24): Damaging cabbage wherever control measures are not put into practice in northern Utah.

HARLEQUIN BUG (Murgantia histrionica Hahn)

Tennessee. G. M. Bentley (August): Has been very apparent on cabbage, cauliflower, and mustard in many parts of the State.

Mississippi. C. Lyle (August 24): Specimens were collected at Holly Springs on August 23. Complaints of this insect injuring collards, cabbage, and turnips were received.

PEAS

PEA APHID (Illinoia pisi Kltb.)

Maine. J. H. Hawkins (August 5): Parasites, predators, and a fungus disease checked what threatened to become a serious outbreak on canning and garden peas in central Maine. Most important of all in checking the outbreak was the fungus that commonly attacks the pea aphid.

CUCUMBERS

PICKLEWORMS (Diaphania spp.)

Virginia. H. G. Walker and L. D. Anderson (August 23): Melon or pickleworms were very scarce in cantaloup and squash fields at Norfolk early in the season, but they are very abundant in the late plantings of these crops.

South Carolina. F. Sherman (August 23): Prevalent in cucumbers at Clemson, in the western part of the State.

ASPARAGUS

ASPARAGUS BEETLE (Crioceris asparagi L.)

Georgia. J. R. Thomson, Jr. (August 16): Larvae were found feeding on the tips of young asparagus at Fort Valley; adults also present on plants.

California. J. Elmore (July 31): Very abundant at Santa Ana, Orange County, on 2 1/2 acres of asparagus, there being 15 to 20 adults and as many larvae per plant. The grower reported injury to shoots earlier in the season.

SQUASH

SQUASH BUG (Anasa tristis Deg.)

New York. N. Y. State Coll. Agr. News Letter (August 16): In Niagara County squash bugs have been particularly pestiferous this year and seem to be extremely hard to kill in small plantings.

Virginia. H. G. Walker and L. D. Anderson (August 28): Have been more abundant in Norfolk than usual and have been rather injurious in several squash fields and have even migrated to nearby watermelon and cantaloup fields where they did considerable damage.

Iowa. H. E. Jaques (August): Occurred throughout the central and southwestern parts of the State, also in Osceola County, in the northern part.

Missouri. L. Haseman (August 20): During the latter half of August swarms of adults have been attacking late squashes at Columbia and several complaints have also been received from over the State. They are mating and ovipositing.

Nebraska. M. H. Swenk (August 20): Damaging squash plants in Custer County on August 7.

Utah. G. P. Knowlton (August 24): Damage is still reported, although more reports of injury were received earlier in the season. Most farmers are no longer raising squash in infested areas because of this pest and most of the State is now infested.

SQUASH BORER (Melittia satyriniformis Hbn.)

Virginia. H. G. Walker and L. D. Anderson (August 28): Very abundant and injurious near Norfolk.

Ohio. T. H. Parks (August 26): Reports of injury have come from Portage and Franklin Counties.

Louisiana. S. S. Sharp (August 25): This insect has been abundant around Baton Rouge during the last month.

ONIONS

ONION MAGGOT (Hylemyia antiqua Meig.)

Utah. G. F. Knowlton (August 2): Reported damaging onions at Vernal, Uintah County.

STRAWBERRY

A CHRYSOMELID (Diachus auratus F.)

Wyoming. Margaret Greenwald (August 12): The beetle fed on the ripening berries of the first crop at Powell, doing considerable damage. Beetles were feeding on leaves and petioles in a jar, and in the field were feeding on the petals and pollen of the blossoms of the second crop. The infested rows of the patch were dusted on August 11. Severe damage was done to berries on old plants, while no beetles were noticed on fruit of young plants in adjoining rows.

TOBACCO

HORNWORMS (Protoparce spp.)

Tennessee. L. B. Scott (August 17): Small larvae of the tomato and tobacco worms are very numerous and in untreated tobacco fields the damage is rapidly becoming severe. Most of the worms are less than 1-1/2 inches long.

TOBACCO FLEA BEETLE (Epitrix parvula F.)

Tennessee. L. B. Scott (August 11): The infestation in central Tennessee dropped sharply during the 10-day period ended August 10. Based on observations in ten random fields the infestation dropped about 50 percent. (August 17): The tobacco flea beetle has suddenly become extremely numerous. During the 7-day period ended August 16 the infestation tripled in most fields. Many fields average 50 beetles per plant, with 100 per plant in some fields.

Kentucky. M. L. Didlake (August 24): Tobacco flea beetles are injurious at Shelbyville.

C O T T O N I N S E C T S

BOLL WEEVIL (Anthonomus grandis Boh.)

South Carolina. F. F. Bondy (July 31): Boll weevils continue to increase in number in Florence County, but migration has not started. Some sections report serious damage and some farmers are dusting.

Georgia. K. P. Conradi (August 7): Many fields in McIntosh County which were practically free of weevils 10 days ago are now generally infested.

P. M. Gilmer (August 7): At Tifton, in southern Georgia, upland cotton is getting beyond the stage of damage. On Sea Island cotton there has been a tremendous increase in population within the last 10 days, due to migration, and considerable damage is being caused to bolls.

W. L. Lowry (August 7): In Lowndes and Echols Counties rapid emergence and extensive migration have increased the infestation during the past week. At Valdosta on one plantation of Sea Island cotton the infestation increased from an average of 13 percent on July 30 to 66 percent on August 6. Damage in some fields is severe with weevils attacking full-grown bolls of Sea Island.

Florida. K. H. Smith (August 21): In Alachua County the weevil in Sea Island cotton squares increased from an average of 35.2 percent in 13 untreated fields examined during the week ended July 31 to 67.3 percent in 15 fields examined during the week ended August 21.

Mississippi. C. A. Henderson and J. E. Ragland (August 14-21): In Oktibbeha County the infestation is light, about the same as last year, the average square infestation in eight fields being 21 percent as compared to 20 percent for the same week in 1936.

E. W. Dunnam. (August 21): Infestation in Washington County is concentrated in late cotton and some damage is being done. Some farmers are poisoning late spots. The infestation ranges from 40 to 60 percent. Ninety-five percent of the crop is mature.

Louisiana. R. C. Gaines (August 21): At Tallulah, in the Delta section, damage is occurring in only a few isolated fields of young cotton. Some commercial poisoning was done during the past week.

Texas. K. P. Ewing (July 31): In Calhoun County many farmers claim that the weevil infestation is worse than ever before. (August 14): Weevils are still a serious menace in the young cotton and most farmers are dusting. On the older cotton a good crop was set before the weevils became abundant.

R. W. Moreland (August 21): At College Station (eastern Texas) boll weevils are still injuring late cotton.

Oklahoma. C. F. Stiles (August 24): No doubt the infestation is lighter over the entire cotton-producing section of the State than it has been for a number of years. McCurtain and Choctaw are the only counties reporting injury.

A WEEVIL (Compsus aricephalus Say)

Louisiana. H. L. Dozier (August 9): This beetle was observed ragging foliage of cotton at Sligo, but no serious damage was being done. It was also observed at Bossier City on cotton. This is the first time that the insect has been noticed on cotton in recent years.

COTTON LEAF WORM (Alabama argillacea Hbn.)

South Carolina. F. F. Bondy (August 25): The first leaf worms at Florence--several half-grown larvae--were seen today.

Georgia. K. P. Conradi (July 31): In McIntosh County (southeastern Georgia) one three-fourths-grown larva was found in the experimental plots on July 29.

W. L. Lowry (August 7): Only one specimen has been found in Echols County (southern Georgia). There have been light infestations sporadically around Tifton.

Florida. J. R. Watson (August 9): Leaf worms are more abundant around Gainesville than they have been since 1912. In Gilchrist County one farmer reports that his Sea Island cotton has been entirely defoliated.

K. H. Smith (August 28): The leaf worm is found in all fields of Alachua County and in about 25 percent of the fields the cotton has been completely defoliated.

Tennessee. G. M. Bentley (August 25): The cotton leaf worm was reported from Tipton County today.

Mississippi. C. Lyle (August 24): The first leaf worm was found at State College on August 5. Very light infestations were reported from Bolivar County on August 10.

Louisiana. C. O. Eddy (August 25): A generation of leaf worms appeared around Opelousas in Saint Landry Parish about August 7, and by August 12 there were other infestations in the parish. They were found defoliating cotton south of Lafayette, Lafayette Parish, recently.

R. C. Gaines. The first specimen was found near Tallulah on August 7. The larva was about three-fourths grown.

Arkansas. D. Isely (August 24): The leaf worm appeared very late, the first record being made on August 17 at Lafayette. It now appears that the larvae are scattered over the State, although the infestations are light.

Oklahoma. C. F. Stiles (August 24): The insect has been reported throughout the southeastern part of the State and threatens to damage late cotton. Control measures have been started in some instances.

Texas. F. L. Thomas (Progress Report Tex. Agr. Exp. Sta.) (August 14): Leaf worms have been found in the vicinity of Lubbock, Lubbock County. (August 21): Reported from Dawson County, but not in sufficient numbers to cause injury. (August 28): Found in Tom Green County and control measures are being used in Smith County.

K. P. Ewing (August 7): At Port Lavaca the cotton leaf worm is making no progress in the old cotton but is appearing in the young cotton. As this cotton is being dusted for boll weevil control, the leaf worms are also being controlled.

R. W. Moreland (August 21): In Brazos and Burleson Counties some dusting is being done to control leaf worms in the young cotton.

A. J. Chapman (August 21): At Presidio, in the Big Bend area, leaf worms were sufficiently abundant to justify spot poisoning on one farm.

Arizona. W. A. Stevenson (August 21): Several leaf worms, approximately 2 days old, were found at Continental on August 20. On the same day one worm was found at Calabasas.

PINK BOLLWORM (Pectinophora gossypiella Saund.)

Texas. A. J. Chapman (August 28): The records in the Big Bend indicate that the percentage of boll infestation and the number of worms per boll are considerably higher than at this time last year. The crop is also further advanced and is rapidly maturing.

COTTON LEAF PERFORATOR (Bucculatrix thurberiella Busck)

California. O. A. Pratt (August 18): There has been during the past 3 weeks a very severe outbreak and the growers are reporting heavy losses in the Imperial Valley. The insect had done little damage until the latter part of July when it began to increase rapidly.

Arizona. T. P. Cassidy (August 21): Several reports at Tucson during the last 10 days, but we have not found any of the infestations heavy enough to cause commercial damage.

COTTON LEAF MINER (Nepticula gossynii Forbes & Leonard)

Puerto Rico. L. C. Fife (August 7): Found this species on cotton at Boqueron on the southern coast of Puerto Rico in 1935-36 and in 1936-37. It occurred only in limited numbers and the damage caused was negligible. Have also taken it on hollyhock (Althaea rosea) at Mayaguez.

BOLLWORM (Heliothis obsoleta F.)

South Carolina. F. F. Bondy (July 31): A few bollworms have been found feeding

on squares at Florence, but no appreciable damage.

Georgia. K. P. Conradi (August 7): A few bollworms have been found in plots in Chatham and McIntosh Counties in Sea Island cotton. (August 27): Bollworms are causing serious damage in some fields of Sea Island cotton in McIntosh County.

W. L. Lowry (August 14): Increased injury was noted in most fields examined recently in Lowndes and Echols Counties.

P. M. Gilmer (August 7): Bollworms are present in small numbers at Tifton, but the damage is only local and not severe.

Florida. J. R. Watson (August 23): Fields, particularly those planted near cornfields, have been badly infested. In some fields 10 percent of the bolls were destroyed. In every instance the corn had matured and become unattractive to the insect.

K. H. Smith (August 14): Numerous bollworms were found in several fields during the week and in some fields near Gainesville they were causing considerable damage.

Mississippi. C. A. Henderson and J. E. Ragland (August 28): A few bollworms are still found on cotton, but they are doing little damage.

E. W. Dunham (August 21): Only slight damage to cotton has been reported throughout the season in Washington County.

Louisiana. H. L. Dozier (August 7): A heavy general infestation was found on 1,600 acres of cotton at Curtis, in Bossier Parish. An estimated loss of 40 percent has already been done. Squares and bolls of all sizes have been ruined. It is the worst outbreak I have ever seen.

Texas. R. W. Moreland (August 7): In Brazos and Burleson Counties, in eastern Texas, injury has been light in most all of the old cotton, but is heavy in the young cotton.

K. P. Ewing (August 21): In Calhoun County this insect continues to damage young cotton. It is perhaps the worst menace to the several thousand acres of June-planted cotton in this and other southern counties.

A. J. Chapman (August 21): The cotton bollworm infestation has been much more severe this year than in any previous year.

COTTON FLEA HOPPER (Psallus seriatus Reut.)

South Carolina. F. F. Bondy (July 31): There have been very few flea hoppers in Florence County and practically no damage.

Georgia. K. P. Conradi (August 7): In McIntosh County no flea hoppers have been found.

P. M. Gilmer (August 7): No flea hopper injury has been experienced in southern Georgia at Tifton, nor in Lowndes and Echols Counties.

Florida. K. H. Smith (August 14): Two flea hoppers, taken in a field near Worthington August 13, were the first seen during the season.

Mississippi. E. W. Dunnam (August 14): In Washington County damage has been noted on one plantation 6 miles from Leland. The insects had left the field when examined.

Louisiana. R. C. Gaines (August 28): Very little damage has been caused in Madison Parish.

Texas. R. W. Moreland (August 21): In Brazos and Burleson Counties practically no flea hoppers are to be found in the old cotton and the infestation seems to be spotted in young cotton.

K. P. Ewing (August 7): With the continued dry weather there has been practically no hatch of eggs and the infestation has gradually diminished until in most fields of young cotton there is only a small amount of damage being done. (August 21): Some damage continues in the June-planted cotton.

F. L. Thomas (Progress Report Agr. Exp. Sta.) (August 21): Flea hoppers continue to cause damage in young growing cotton, particularly in Calhoun, Milam, and Tom Green Counties. Unusual damage has occurred in Tom Green County.

LEAFHOPPERS (Empoasca spp.)

Louisiana. H. L. Dozier (August 19): E. solana DeL. and E. fabae Harr. are abundant on cotton at Sligo. (Det. by P. W. Oman.)

PLANT BUGS (Lygus spp.)

Mississippi. E. W. Dunnam (August 14): The tarnished plant bug (L. pratensis L.) is very numerous in most fields of late cotton at Stoneville in the Delta section, but did not appear in great enough numbers to cause injury to early cotton. (August 28): Some dusting is being done.

New Mexico. J. R. Eyer (August 18): There is an outbreak of Lygus sp. in the cotton near Las Cruces.

RAPID PLANT BUG (Adelphocoris rapidus Say)

Florida. K. H. Smith (July 31): Appearing in all cotton fields in Alachua County and in many causing severe damage.

F O R E S T A N D S H A D E - T R E E I N S E C T S

BAGWORM (Thyridopteryx ephemeraeformis Haw.)

Delaware. L. A. Stearns (August 2): More abundant than usual on evergreens throughout the entire State.

H. F. Dietz (August 24): Has been unusually abundant and serious on arborvitae throughout the northern half of Delaware.

Maryland. E. M. Cory (August 7): Generally very numerous over the State on evergreens.

Virginia. H. G. Walker and L. D. Anderson (August 28): Many reports of bagworms injuring shade trees were received from Norfolk.

South Carolina. F. Sherman and W. C. Nettles (August 23): Reports from various localities.

Georgia. O. I. Snapp (August 2): Bagworms are unusually abundant at Fort Valley. As many as one peck were hand picked from one small arborvitae.

Ohio. E. W. Mendenhall (August 10): Quite bad on arborvitae, elms, and other trees in Bexley. Some arborvitae were nearly defoliated. On apple trees at Wade, Washington County. They are also very bad on nursery stock in Belpre, Washington County.

N. F. Howard (August 17): Several requests for control on arborvitae have been received from Columbus.

Indiana. J. J. Davis (August 23): Reported damaging evergreens at Terre Haute and Greensburg.

Kentucky. M. L. Diddlelake (August 24): Abundant at Lexington, Olin, and Maysville.

Tennessee. G. M. Bentley (August): Generally there have been remarkably few bagworms this year.

Mississippi. C. Lyle (August 24): Specimens taken from shrubbery at Tupelo on July 23 and from pecan at Cuevas on August 16. Reports of injury to arborvitae were received from D. W. Grimes of Durant and M. L. Grimes of Meridian.

Texas. C. B. Nickels (August 14): Have defoliated several species of trees, especially evergreens and hackberry, in the vicinity of Brownwood.

FALL WEBWORM (Hyphantria cunea Drury)

Vermont. J. Laliberty (August 17): Found in my front yard at Norton.

Connecticut. M. P. Zappe (August 23): Nests are very scarce. Hardly any have been observed. Scarce in 1936 and even less in 1937.

- New York. New York Times (August 30): The back yards of New York City are in the grip of an invasion of webworms, the fall webworm, according to the arboriculturist of the Parks Department, who also said that it is the worst epidemic of this insect in 7 or 8 years. Trees in the parks and on the streets are free from the caterpillars.
- Delaware. L. A. Stearns (August 24): During the first 2 weeks in August the fall webworm was observed throughout the State.
- Georgia. O. I. Snapp (August 20): Abundant at Fort Valley, and webs containing newly hatched to half-grown larvae are now common on pecan trees.
- Ohio. E. W. Mendenhall (August 27): Very bad on elms, apples, cherry, etc.
- Tennessee. G. M. Bentley (August): Becoming apparent in different parts of the State, primarily in middle Tennessee.
- Louisiana. B. A. Osterberger and L. O. Ellisor (August 25): On pecan, willow, and persimmon trees, in some cases very serious defoliation being noticed. Second-generation larvae are unusually abundant on pecans at Baton Rouge.

SATIN MOTH (Stilpnotia salicis L.)

- New Hampshire. A. F. Burgess (July): Poplar trees were found heavily infested in the village of West Lebanon. On July 16 many adults were noted on electric light poles in West Lebanon.
- Vermont. A. F. Burgess (July): Poplar trees were found heavily infested in the village of Wilder.
- Washington. M. J. Forsell (August 27): There is no visible damage at Seattle, King County, where formerly it completely stripped the trees. Parasites were distributed at one time and they seem to have effected complete control. This is one of the best two examples of biological control in this area.

WHITE-MARKED TUSSOCK MOTH (Hemerocampa leucostigma S. & A.)

- New York. R. E. Horsey (July): Egg mass found July 26. Formerly a severe pest in Rochester, but of late years it is uncommon.

TWIG GIRDLER (Oncideres cingulatus Say)

- Missouri. L. Haseman (August 21): The oak twig pruner, a common pest, is quite abundant and the larvae are over half grown in central Missouri.

ASH

BANDED ASH BORER (Neoclytus caprea Say)

- Nebraska. M. H. Swenk (August 20): The banded ash borer was reported infesting ash trees in Nuckolls County on July 29.

CARPENTER WORM (Prionoxystus robiniae Peck)

Nebraska. M. H. Swenk (August 20): The carpenter worm was reported to be working in ash trees in Nuckolls County on July 29.

A MITE (Eriophyes fraxiniflora Felt)

Utah. G. F. Knowlton (August 19): The work of this mite is evident upon blue ash in a nursery at Logan.

BIRCH

BIRCH LEAF MINER (Femusa pumila Klug.)

New England and New York. E. P. Felt (August 14): Was somewhat generally abundant in southern New England and New York State, causing appreciable defoliation in some localities.

CATALPA

CATALPA SPHINK (Ceratomia catalpae Bdv.)

Delaware. H. F. Dietz (August 24): Many large trees of Catalpa bignonioides in New Castle County have been completely defoliated.

Maryland. E. N. Cary (August 18): There is a general infestation in Frederick.

Gertrude Myers (August 7): Catalp trees along Avery Road, 2 miles east of Rockville, are being defoliated.

Ohio. E. W. Mendenhall (August 11): Destroying the foliage of catalpa trees in Beverly and Belpre, Washington County.

Kentucky. M. L. Diddle (August 24): Completely defoliated many trees throughout the State.

CATALPA MIDGE (Itonida catalpae Comst.)

Connecticut. E. P. Felt (August 14): Has been injurious in the Stamford area.

ELM

ELM LEAF BEETLE (Galerucella xanthomelaena Schr.)

New York. L. H. Worthley (July): Slippery elm foliage has suffered considerable damage along the Hudson River from Buchanan in Westchester County to the Putnam County line. On Long Island English elms have been severely defoliated, especially in the vicinity of Oyster Bay.

New Jersey. L. H. Worthley (July): Elm foliage is in better condition than last year, although considerable elm leaf beetle feeding is apparent

throughout much of the infested zone. Injury showed up most prominently following several weeks of hot, dry weather late in the month.

Maryland. E. N. Cory (July 27): Elm leaf beetle infesting elm at Eastern.

MOURNING-CLOAK BUTTERFLY (Hamadryas antiopa L.)

Utah. G. F. Knowlton (August 24): Larvae of the mourning-cloak butterfly have damaged elms at Logan, Brigham, and Salt Lake City.

C. J. Sorenson (August 22): At Logan, Cache County, the spring elm caterpillar damaged a few Siberian elms.

ELM LACEBUG (Corythucha pallida ulmi C. & D.)

Vermont. H. L. Bailey (August 19): Very abundant on elms in Rutland County, southwestern Vermont. Foliage of many trees is completely yellowed.

Massachusetts and Connecticut. E. P. Felt (August 14): Has been increasing in numbers for the past 10 years along automobile route #7, especially from near New Milford, Conn., to Great Barrington, Mass. The infestation is restricted practically to trees growing in thickets or grassy areas.

Connecticut. W. E. Britton (August 23): This lacebug has been rather prevalent on elm trees in the northwestern portion of Litchfield County, according to Wallace. Specimens were recently received from Kent.

Florida. J. R. Watson (August 23): Has quite generally browned the elm tree.

EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

New York. R. E. Horsey (July 27): I found adults, moving young, and shriveled scales that had hatched earlier in the season on elm at Rochester today.

Maryland. E. N. Cory (August): Noted on elm in Dickerson.

Indiana. J. J. Davis (August 23): Continued reports from the northern half of the State emphasize the increasing importance of this pest.

FIR

DOUGLAS FIR TUSsock MOTH (Homocidus pseudotsugata McD.)

Idaho. J. C. Eyenden (August 8): An outbreak at Hailey, in southern Idaho, was reported in 1936, at which time there were some small spots of infestations. The 1937 infestation indicates a marked increase in the size of the infested area as well as in the severity of the defoliation. An outbreak of Nerytia canosaria Walk. is associated with the epidemic of the Douglas fir tussock moth. This insect is quite numerous and will aid in the defoliation of the trees.

A LOOPER (Ellopiia sp.)

Idaho. J. C. Evenden (August 3): Ellopiia, near pellucidaria G. & R., was defoliating forest trees on large areas of forest land in northern Idaho, with white fir as the preferred host. Abnormal numbers of the moths were recorded last fall, although no serious defoliation occurred.

HEMLOCK

A SCALE INSECT (Aspidiotus tsugae Marlatt)

Connecticut. W. E. Britton (August 23): Specimens of what appear to be this scale were received from Greenwich. Infested leaves were yellow and dropping, indicating considerable injury.

LARCH

LARCH CASEBEARER (Coleophora laricella Hbn.)

Switzerland. H. D. Smith (July 29): Going over Simplone Pass to Italy on northside of the Alps the larch forests present a brown appearance. Very heavy infestation can be seen for miles. Here and there a tree has escaped heavy damage.

LOCUST

LOCUST LEAF MINER (Chalcous dorsalis Thunb.)

Pennsylvania and West Virginia. L. M. Peairs (August 13): Injury is not noted at all at Margentown, W. V., but just a few miles north in Pennsylvania, north to Greensburg, the miner is getting worse. The woods have a very decidedly brownish cast due to extensively injured locust trees. It is the worst infestation I have seen for several years.

Maryland. E. N. Cory (August 5): There is a general browning of the locust trees in most parts of the State east of the fall line.

LOCUST BORER (Cyrtene robiniae Forst.)

Nebraska. M. H. Swenk (August 20): From Thurston County on August 14 came a complaint of seriously infested locust trees.

MAPLE

AN APHID (Neoprociphilus aceris Monell)

Virginia. A. M. Woodside (August 23): An infestation of a large bark-feeding aphid, probably N. aceris, was observed at Staunton on the lower branches of a few sugar maples on August 12.

WOOLLY ALDER APHID (Prociphilus tessellatus Fitch)

Indiana. J. J. Davis (August 23): Continues to be reported as exceptionally abundant on hard maple in the northern half of the State.

COTTONY MAPLE SCALE (Pulvinaria vitis L.)

Indiana. J. J. Davis (August 23): Many reports have been received from the two northern tiers of counties, especially the western counties. The scale is undoubtedly more abundant than for many years.

OAK

A LEAF MINER (Lithocolletis hamadryadella Clem.)

New York. R. E. Horsey (July 30): A request for information about this insect was received at Rochester. It had badly disfigured leaves on black or red oak in an ornamental planting.

PINE

EUROPEAN PINE SHOOT MOTH (Rhyacionia buoliana Schiff.)

Massachusetts. E. P. Felt (August 14): The European pine shoot moth has become somewhat troublesome in Milton.

Connecticut. E. P. Felt (August 14): Occurs in greater numbers than for the past few years in the Stamford area.

New Jersey. F. A. Soraci (August 7): Heavy infestation, and scattered throughout Passaic County. Larvae have entered the buds and in some cases are 1/4 inch long.

SPRUCE BUDWORM (Cacoecia fumiferana Clem.)

Michigan. J. K. Kroeber (August 6): Extensive defoliation of jack pine in Marquette County.

WHITE-PINE WEEVIL (Pissodes strobi Peck)

New York. R. E. Horsey (August 8): On August 8, dead tips of Serbian spruce (Picea omorika) at Rochester, were pointed out to me as caused by this insect. The weevil has caused more or less damage to white pine in ornamental plantings for several years past at Rochester.

A SAWFLY (Itycorsia zappei Rohw.)

New Jersey. F. A. Soraci (August 10): An outbreak of the false pine webworm was found in a nursery. The infestation was observed on June 24 at which time the larvae were completing feeding and were entering the soil. The infestation extended over a planting of about 5 acres of Pinus resinosa and webs were formed on all limbs of the trees. At the present time only those needles of this year's growth remain. The larvae are in the soil about the bases of the trees.

PINE NEEDLE SCALE (Chionaspis pinifoliae Fitch)

Ohio. E. W. Mendenhall (August 27): Quite bad on pine tree stock in a nursery at Lancaster.

POPLAR

COTTONWOOD BORER (Plectrodera scalator F.)

Nebraska. M. H. Swenk (August 20): A specimen of the cottonwood borer was mailed in from Franklin County on July 23. A report sent in from Merrick County on July 24 indicated that the borer was killing cottonwood trees in that locality.

SPRUCE

EUROPEAN SPRUCE SAWFLY (Diprion polytomum Htg.)

Maine. H. J. MacAloney (July): The survey now being conducted in northern Maine has revealed areas of heavy defoliation covering in the aggregate thousands of acres. The infestations found thus far are located along the Allagash and St. Johns Rivers. On the Allagash trees have died from last year's defoliation. The infestation in certain areas is fully as heavy as at Parke Reserve, Kamouraska County, Quebec, Canada. Sample collections of cocoons in the duff have shown that 20 living cocoons per square foot occur in certain areas.

WILLOW

POPLAR AND WILLOW BORER (Cryptorhynchus lapathi L.)

Indiana. J. J. Davis (August 23): Mottled poplar and willow borer was damaging willow at Muncie according to a report received August 5.

Special note--A native American plant, Salvia reflexa, belonging to the mint family, has become a noxious weed in Australia. It would be of considerable interest if entomologists within the range of this plant in the Great Plains and Rocky Mountain States would report on all insects that have been recorded from this plant.

INSECTS AFFECTING GREENHOUSE
AND ORNAMENTAL PLANTS AND LAWNS

HAIRY CHINCH BUG (Blissus hirtus Montd.)

New York. E. P. Felt (August 14): The hairy chinch bug has been locally abundant and injurious to lawns in southwestern New England and southeastern New York.

SOD WEBWORMS (Crambus spp.)

California. R. E. Campbell (August 26): Innumerable inquiries are being received regarding the control of sod webworms in Los Angeles and surrounding communities where bluegrass and bent lawns are being seriously damaged.

OYSTERSHELL SCALE (Lepidosaphes ulmi L.)

Massachusetts. E. P. Felt (August 14): Oystershell scale was extremely abundant on the smaller beech trees growing under wild conditions at Great Barrington. The insects were so numerous as to kill a considerable proportion of the small twigs.

Indiana. J. J. Davis (August 23): Reported destructively abundant on peony at Tipton, August 4.

AZALEA

AZALEA LACEBUG (Stephanitis pyrioides Scott)

Delaware. H. F. Dietz (August 24): A heavy infestation of this pest was found on Azalea indica in an extensive planting at Wilmington.

BARBERRY

A PYRALID (Omphalocera dentosa Grote)

Pennsylvania. C. C. Hill (August 30): Severe damage to Japanese barberry was observed at Greason.

Maryland. E. N. Cory (August 18): Noted attacking barberry bushes at Libertytown.

BOXWOOD

BOXWOOD LEAF MINER (Monarthropalpus buxi Laboulb.)

Maryland. E. N. Cory (July 30): Boxwood leaf miner noted on American boxwood at Hagerstown.

DAHLIA

SUNFLOWER WEEVIL (Rhodobaenus tredecimpunctatus Ill.)

Louisiana. H. L. Dozier (August): Rather heavy loss incurred during July and August at Opelousas, large dahlia plants being killed quickly.

CHRYSANTHEMUM

GREENHOUSE LEAF TIER (Phlyctaenia rubigalis Guen.)

Delaware. H. F. Dietz (August 24): An incipient outbreak of this insect was found in extensive greenhouse plantings of chrysanthemums.

ONION THRIPS (Thrips tabaci Lind.)

Delaware. H. F. Dietz (August 24): Serious injury to chrysanthemums in certain greenhouses in the vicinity of Wilmington were investigated during the past month.

A MEMBRACID (Vanduzee segmentata Fowl.)

Louisiana. H. L. Dozier (August 20): A membracid breeding in large numbers on commercial plantings of chrysanthemum at Opelousas. (Det. by F. W. Oman.)

MAGNOLIA

MAGNOLIA SCALE (Neolecanium cornuparvum Thro)

New York. R. E. Horsay (July 30): A few found July 30 on Magnolia acuminata at Rochester. It was numerous last year. The scale was scraped off last summer and the trees were given a miscible oil spray the past spring, which was very effective in destroying the scale.

NINEBARK

A CHRYSOMELID (Calligrapha rhoda Knab)

Ohio. J. S. Houser (August 5): Causing general defoliation of ninebark (Physocarpus sp.) at Toledo.

PRIVET

A THRIPS (Psilothrips sp.)

Maryland. E. N. Cory (August 13): Psilothrips sp. was found attacking privet hedge at Baltimore. (Det. by J. R. Watson.)

RHODODENDRON

RHODODENDRON LACEBUG (Stephanitis rhododendri Horv.)

Delaware. H. F. Dietz (August 24): Has caused very severe injury in several ornamental plantings in the vicinity of Wilmington. In all cases these plantings were in unfavorable situations.

ROSE

ROSE MIDGE (Dasyneura rhodophaga Coe.)

Indiana. J. J. Davis (August 23): Has been reported from a number of additional greenhouses in central and north-central Indiana.

MOSSY ROSE GALL (Rhodites rosae L.)

New York. R. E. Horsey (August 10): Rose bedeglar was noted on Rosa canina, a large mosslike mass of green fibre, in Rochester. The galls contain live larvae.

SPIREA

APPLE TWIG BORER (Schistoceros hamatus F.)

Mississippi. C. Lyle (August 24): Specimens of the grape cane borer were found boring in the stems of a Spirea plant at Como on August 16.

I N S E C T S A T T A C K I N G M A N A N D

D O M E S T I C A N I M A L S

MAN

FLEAS (Ctenocephalides spp.)

United States. F. C. Bishopp (August): These pests have been unusually troublesome this summer.

Connecticut. B. H. Talden (August 21): More reports, from Middlesex County, of infestations in buildings so far during August that we have had before in any one month.

South Carolina. W. C. Nettles (August 23): Several reports of invasion of residences. These all happen to be from the western part of the State.

Indiana. J. J. Davis (August 23): Has been more numerous than for several years in homes and farm buildings during the past month. All reports received have come from the northern half of the State.

Tennessee. G. M. Bentley (August): The dog flea continues to be a pest in homes where no attention has been given the dog.

DEER FLIES (Chrysops spp.)

Utah. G. F. Knowlton (August 7): Deer flies are annoying to man at Lakota, Garden City, Benson, and Murray, in northern Utah.

AMERICAN DOG TICK (Dermacentor variabilis Say)

Massachusetts. F. C. Bishopp (August 30): Two cases of Rocky Mountain spotted

fever occurred at East Brewster on Cape Cod in July. This is the first report of this dread disease of man in New England. Each individual had been bitten by wood ticks and this species of tick is abundant throughout Cape Cod and on adjacent islands.

Connecticut. F. German (August 20): A case was observed at New Haven where these ticks were breeding freely and the dog heavily infested.

District of Columbia. F. C. Bishopp (August): Although the numbers of the American dog tick decreased in Washington and vicinity to very small numbers during August, examinations of animals indicate they are more abundant than they were at the same time last year.

Nebraska. M. H. Swenk (August 20): A specimen of common wood tick found in a house was sent in from Merrick County on August 6.

BLACK WIDOW SPIDER (Latrodectus mactans F.)

Kentucky. M. L. Didlake (August 24): Black widow spiders are abundant near Danville. One man was bitten.

Mississippi. C. Lyle (August 24): A specimen of the black widow spider was sent to this office by a correspondent in Calhoun County.

Missouri. L. Haseman (August 21): This month and, in fact, throughout the summer, we have not had the usual number of complaints about this much feared spider.

Nebraska. M. H. Swenk (August 20): A complaint of the presence of the black widow spiders came from Lincoln County on July 23.

CATTLE

SCREW WORM (Cochliomyia americana C. & P.)

South Carolina. W. E. Dove (August 31): An infestation at Monck's Corner treated during the latter part of July was reported with specimens of C. americana. At Walterboro cases have been occurring during the past 3 weeks, and are said to be numerous in the vicinity of Beaufort.

Georgia. W. E. Dove (August 31): For the 5-week period ended August 20 there were 411 cases reported from different southern and coastal counties of Georgia. During the week ended August 27 localized outbreaks were reported in Ware, Atkinson, and Brooks Counties. Estimates of cases increased in Brooks County from 500 to 1,500.

Florida. W. E. Dove (August 31): For the 5-week period ended August 20 there were 5,663 cases occurring among 750,776 animals. A localized outbreak of almost 6 percent of the animals in Dixie County was brought under control by cooperating stockmen. A new outbreak now occurs as far west as Gadsden County. During the month the infestation decreased to small numbers in the southern counties of the peninsula but showed a decided increase in the northern counties where Gulf coast ticks are becoming a serious problem.

Kansas. W. E. Dove (August 31): Scattered cases of screwworms are present at different places in the grazing sections of Kansas where biting flies are now causing a serious outbreak.

Oklahoma. W. E. Dove (August 31): Reports from stockmen in Stephens, Love, McLain, and Bryan Counties show very light infestations for the month ended August 15.

Texas. W. E. Dove (August 31): Stockmen in 56 counties, in reply to questionnaires, reported 6,859 cases, representing 498,793 animals. In the principal sheep- and goat-breeding area 9 counties reported 860 infestations among 35,762 animals. In Briscoe County, of the Panhandle, 204 cases were reported among 3,000 animals. In eastern Texas stockmen are treating injuries when animals are dipped for ticks, and screwworm cases in this area are of rare occurrence. There is now a strong tendency for cases to build up in the coastal areas between Willacy and Jackson Counties in bites of the Gulf coast tick.

Arizona. W. E. Dove (August 31): County agent K. A. Boevers reports 50 infestations among 18,000 animals in the southern half of Greenlee County.

HORSES

STABLEFLY (*Stomoxys calcitrans* L.)

General. F. C. Bishopp (September 2): A rather severe outbreak of stableflies beginning about the middle of July has continued to cause considerable losses to farmers and stockraisers in the North Central States. In the grazing area of southern Kansas cattle were reported to have suffered an average loss in weight of 50 pounds per head on account of the pest. Recent reports from Iowa indicate that the outbreak is beginning to subside in that State.

Iowa. S. W. Simmons (June 28 to July 13): In a survey of 37 farms in the vicinity of Ames the stablefly was the worst of all insect pests of horses. Of the 101 animals examined 19 were mules. It was the opinion of their owners, in all instances except one, that stableflies were worse on mules than on horses. One farmer owning both mules and horses said that he had not been able to use his mules on several occasions due to the abundance of stableflies. Examination revealed the preference of stableflies for mules. It is estimated that about 80 percent of the farmers regularly use nets on their work animals as protection against the stablefly. In quite a few instances farmers sprayed their animals three or four times daily. Some farmers carried sprays with them.

Missouri. L. Haseman (August 21): Stableflies have been less abundant and vicious than during July.

Kansas. H. R. Bryson (August 24): Biting flies are causing much annoyance to livestock in many sections of the State.

MOSQUITOES (Culicinae)

United States. F. C. Bishopp (August): Brain fever, or encephalomyelitis, of horses has appeared in serious epizootic proportions in the North Central States, especially in Minnesota, South Dakota, Nebraska, and Iowa. Heavy death losses are reported. Rendering plants are unable to handle the dead animals and the farmers are seriously handicapped. The disease is also present in Colorado, Wyoming, Utah, Texas, Virginia, and Maryland, and probably other States are involved. It is important that all information possible on the relative abundance and distribution of various mosquitoes and biting flies be gathered throughout the affected areas.

Georgia. J. B. Hull (July): Increased rainfall during July has apparently increased the abundance and annoyance of the salt marsh mosquitoes Aedes sollicitans Walk. and A. taeniorhynchus Wied. with the former the most troublesome.

Washington. H. H. Stage (July): Aedes aleo-notum Dyar and A. cinereus Meig. were investigated about Lake Tapps, Pierce County.

Utah. G. F. Knowlton (August 12): Mosquitoes are very abundant in the Delta area, in which an outbreak of equine encephalomyelitis is now occurring.

Oregon. H. H. Stage (July 16): A severe epidemic of the mosquito Culex tarsalis Coq. was reported from Lebanon. This species is seldom numerous enough to constitute a pest. A. vexans Meig. and A. aldrichi Dyar and Knab are not abundant in the Portland area. In fact, samples taken at various points in Multnomah County give but 10 to 30 percent of the numbers taken in 1936. A. vexans, which has been severe heretofore in and about Hood River, has been of no consequence this season. The so-called snow or mountain species, A. communis Deg., A. hexodontus Dyar, and A. aboriginis Dyar, have been reported as extremely annoying in several isolated districts throughout the Cascade Mountains.

HOUSEHOLD AND STORED-PRODUCTS INSECTS

CRICKETS (Gryllus spp.)

Virginia. H. G. Walker and L. D. Anderson (August 28): Quite a number of home owners in Norfolk have called, stating that crickets were very abundant in their homes and were eating their clothing.

Wisconsin. C. L. Fluke (August 23): A small brown cricket reported from cities in western counties is particularly troublesome in front of stores, gathering on the doors and windows and entering the stores.

Minnesota. K. A. Kirkpatrick (August 24): Field crickets are unusually abundant.

Nebraska. H. E. Swenk (August 20): Many complaints of annoyance in and around houses by the field cricket have been received during the month of August, coming chiefly from Lancaster and Cass Counties, west to Harlan County.

A report from Garden County on August 11 stated that they were attacking tomatoes in that locality.

Kansas. H. R. Bryson (August 24): Field crickets continue to annoy occupants of houses in both the city and the country. In some instances they have caused considerable damage to household furnishings. Reports have come in from Jewell, Riley, Lincoln, Saline, and Cloud Counties, and from the towns of Mullinville, Dodge City, Lindsborg, Nickerson, and Peabody.

ANTS (Formicidae)

Nebraska. M. H. Swenk (August 20): Ants were reported to be infesting flower beds in Douglas County on July 26, and on July 27 a Grant County correspondent stated that they were proving troublesome in lawns and in trees in that locality. Monomorium pharaonis L. was complained of as bothering in a house and cave in Madison County on August 17.

Mississippi. C. Lyle (August 24): Complaints of Argentine ants (Iridomyrmex humilis Mayr) have been received from Jackson, Durant, West, and Kosciusko.

DARK MEALWORM (Tenebrio obscurus F.)

Kansas. R. T. Cotton (July): An unusual case of injury was recently investigated. The worms, breeding in large numbers in waste meal that had fallen to the ground under a warehouse, were migrating up the walls of the warehouse through cracks in the floor and collecting in the ears of burlap bags of feed. They were not damaging the feed, but the presence of 50 or 60 worms in each ear of the bags rendered them unattractive to prospective purchasers and spoiled the sale of a considerable quantity of feed.

PEA WEEVIL (Bruchus pisorum L.)

Indiana. J. J. Davis (August 23): A heavy infestation reported from Brazil, on August 6. The specimens submitted were in the mature larval and pupal stages.

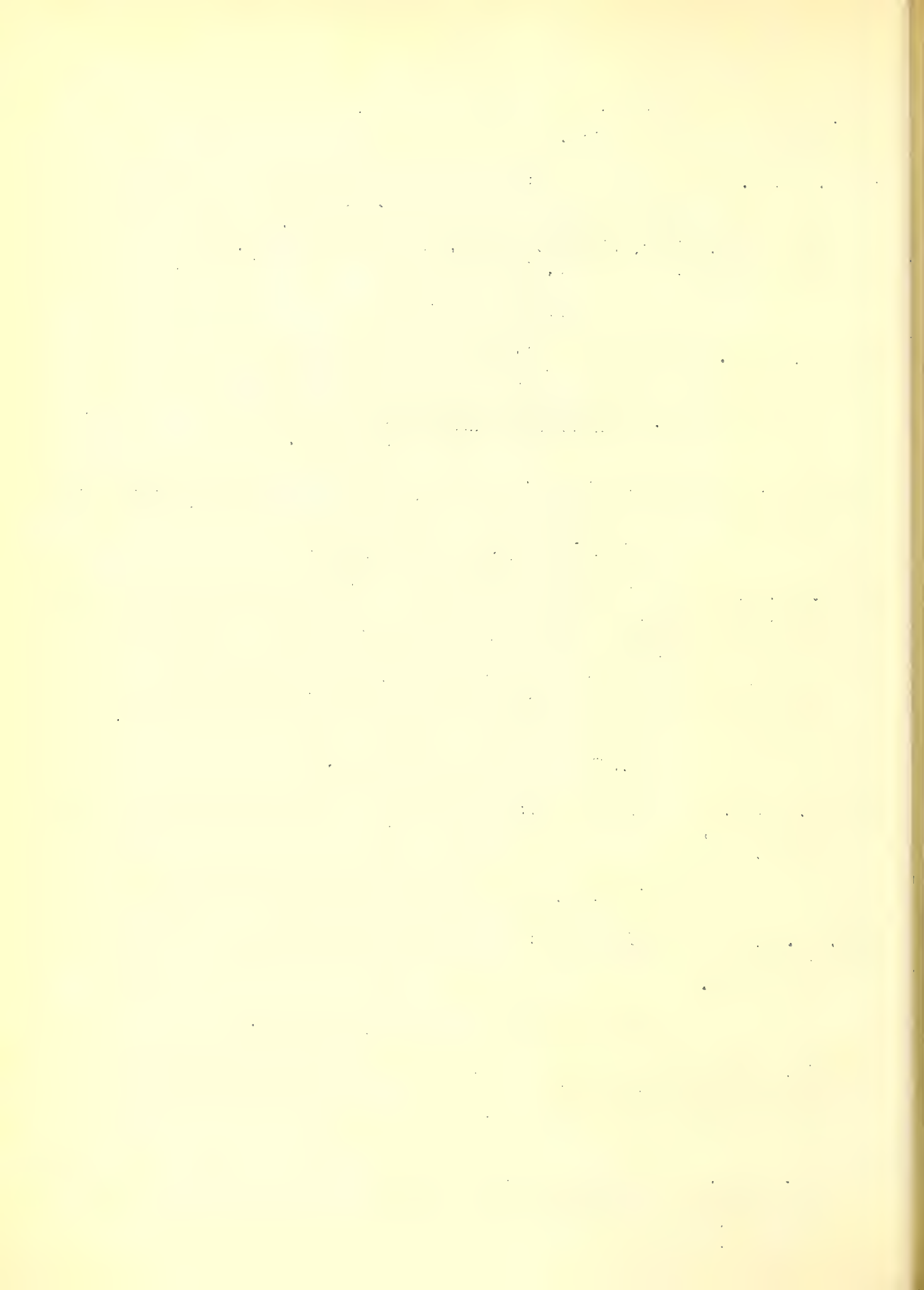
BEAN WEEVIL (Acanthoscelides obtectus Say)

Utah. G. F. Knowlton (August 3): Bean weevils have ruined beans in one home at Logan, and become serious household nuisances as soon as the beans were distributed.

CIGARETTE BEETLE (Lasioderma serricorne F.)

Virginia. E. M. Livingstone (August 18): Warehouses in Richmond in which no control measures are employed appear to have the heaviest infestation of the cigarette beetle since 1933. Old tobaccos brought in from eastern North Carolina are heavily infested.

Nebraska. M. H. Swenk (August 20): A Cuming County correspondent reported that the cigarette beetle was infesting a mohair davenport in that county on August 16, and a Lancaster County correspondent made a similar report on August 20.



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September 15, 1937

Hessian Fly Survey, Harvest-time 1937 United States Bureau of Entomology and Plant Quarantine Cooperating with State entomologists

As shown on the accompanying map, this survey covers the main winter-wheat region of central and eastern United States. Throughout most of this area the hessian fly is now about as scarce as it ever becomes. Weather conditions more or less unfavorable to its activity last fall and again last spring, combined with generally delayed sowing of wheat last fall, have reduced fly populations much below the threatening numbers prevailing in the central part of the winter-wheat belt a year ago.

In Nebraska, Kansas, and Oklahoma infestations at harvest time were extremely light and practically no material damage occurred or is likely to occur this year. Hessian fly populations are also generally low in Iowa, Missouri, northern Illinois, central and northeastern Indiana, Ohio, Kentucky, Tennessee, western and central Pennsylvania, Maryland, Delaware, Virginia, and North Carolina. In these States, however, occasional fields or localities now contain enough infestation to be a possible source of local trouble next fall. A notable feature this year is the unusual abundance of the fly in some northern districts, including northeastern Iowa, southern Wisconsin, and south-central Michigan. Other regions containing moderate-to-severe infestation, in which there is real danger of an outbreak next fall if weather should favor fly activity, are southern Illinois, northwestern and southern Indiana, and southeastern Pennsylvania. The farmers in all these districts should be warned of this danger and advised to observe the safe-sowing dates.

This report is based on the following summarized data, and additional information received from State and Federal entomologists of Iowa and Wisconsin. The field samples used were mostly 50 stems taken on a short circuit into one side of the field.

Area	Fields sampled Number	Stems infested		
		Average Percent	Maximum Percent	Minimum Percent
Nebraska:				
Southwestern-----	7	0	0	0
South-central-----	28	0	0	0
Southeastern-----	68	1	22	0
Kansas:				
Northwestern-----	20	0	0	0
North-central-----	35	0	12	0
Northeastern-----	53	2	18	0
South-central-----	39	0	6	0
Southeastern-----	34	2	14	0
Oklahoma:				
North-central-----	27	0	0	0
Northeastern-----	26	0	0	0
Missouri:				
Northwestern-----	28	1	6	0
West-central-----	32	2	14	0
East-central-----	43	5	30	0
Southwestern-----	31	7	40	0
Southeastern-----	26	4	24	0
Illinois:*				
Northwestern-----	45	2	16	0
Central-----	29	4	32	0
East-central-----	30	2	12	0
Southwestern-----	30	11	56	0
Southeastern-----	37	9	48	0
Michigan:				
South-central-----	30	18	52	0
Southwestern (Berrien Co.):	7	4	12	0
Southeastern (Lenawee Co.):	7	2	6	0
Indiana:				
Northwestern-----	73	14	52	0
Northeastern-----	35	5	14	0
Central-----	71	7	28	0
Southwestern-----	64	18	70	0
Southeastern-----	42	19	84	0

*Mostly from survey by State entomologists.

Area	Fields sampled Number	Stems infested		
		Average	Maximum	Minimum
		Percent	Percent	Percent
Ohio:*				
Northwestern-----	**16	2	-	-
North-central and northeastern**	130	3	-	-
Southwestern-----	** 90	7	-	-
Southeastern-----	**110	2	-	-
Kentucky:				
Western-----	14	5	26	0
East-central-----	16	5	22	0
Tennessee:				
West-central-----	40	2	32	0
Eastern-----	43	3	16	0
Pennsylvania:				
Western-----	15	4	20	0
North-central-----	20	3	12	0
South-central-----	35	8	30	0
Eastern-----	34	10	68	0
Delaware-----	15	4	21	0
Maryland:				
Central-----	25	8	38	0
Eastern-----	15	4	16	0
Virginia:				
Northwestern-----	20	6	42	0
Northeastern-----	45	5	22	0
South-central-----	15	4	13	0
North Carolina:				
North-central-----	40	6	28	0

*Mostly from survey by State entomologists.

**Approximately.

A map of the United States showing the distribution of the American mink (*Mustela vison*) by county. The map is divided into counties, each labeled with a number representing the number of mink reported. Some counties are shaded with diagonal lines, indicating a higher density of mink. The distribution is concentrated in the central and eastern United States, particularly in the Great Lakes region and the Ohio River valley.

County	Number of Mink	Shaded
Alaska	0	No
Idaho	0	No
Montana	0	No
Wyoming	0	No
Nebraska	0	No
South Dakota	0	No
North Dakota	0	No
Minnesota	0	No
Wisconsin	0	No
Illinois	0	No
Indiana	0	No
Michigan	0	No
Ohio	0	No
Pennsylvania	0	No
Delaware	0	No
Maryland	0	No
Virginia	0	No
North Carolina	0	No
South Carolina	0	No
Georgia	0	No
Florida	0	No
Alabama	0	No
Mississippi	0	No
Louisiana	0	No
Arkansas	0	No
Oklahoma	0	No
Kansas	0	No
Nebraska	0	No
South Dakota	0	No
North Dakota	0	No
Minnesota	0	No
Wisconsin	0	No
Illinois	0	No
Indiana	0	No
Michigan	0	No
Ohio	0	No
Pennsylvania	0	No
Delaware	0	No
Maryland	0	No
Virginia	0	No
North Carolina	0	No
South Carolina	0	No
Georgia	0	No
Florida	0	No
Alabama	0	No
Mississippi	0	No
Louisiana	0	No
Arkansas	0	No
Oklahoma	0	No
Kansas	0	No
Nebraska	0	No
South Dakota	0	No
North Dakota	0	No
Minnesota	0	No
Wisconsin	0	No
Illinois	0	No
Indiana	0	No
Michigan	0	No
Ohio	0	No
Pennsylvania	0	No
Delaware	0	No
Maryland	0	No
Virginia	0	No
North Carolina	0	No
South Carolina	0	No
Georgia	0	No
Florida	0	No
Alabama	0	No
Mississippi	0	No
Louisiana	0	No
Arkansas	0	No
Oklahoma	0	No
Kansas	0	No
Nebraska	0	No
South Dakota	0	No
North Dakota	0	No
Minnesota	0	No
Wisconsin	0	No
Illinois	0	No
Indiana	0	No
Michigan	0	No
Ohio	0	No
Pennsylvania	0	No
Delaware	0	No
Maryland	0	No
Virginia	0	No
North Carolina	0	No
South Carolina	0	No
Georgia	0	No
Florida	0	No
Alabama	0	No
Mississippi	0	No
Louisiana	0	No
Arkansas	0	No
Oklahoma	0	No
Kansas	0	No
Nebraska	0	No
South Dakota	0	No
North Dakota	0	No
Minnesota	0	No
Wisconsin	0	No
Illinois	0	No
Indiana	0	No
Michigan	0	No
Ohio	0	No
Pennsylvania	0	No
Delaware	0	No
Maryland	0	No
Virginia	0	No
North Carolina	0	No
South Carolina	0	No
Georgia	0	No
Florida	0	No
Alabama	0	No
Mississippi	0	No
Louisiana	0	No
Arkansas	0	No
Oklahoma	0	No
Kansas	0	No
Nebraska	0	No
South Dakota	0	No
North Dakota	0	No
Minnesota	0	No
Wisconsin	0	No
Illinois	0	No
Indiana	0	No
Michigan	0	No
Ohio	0	No
Pennsylvania	0	No
Delaware	0	No
Maryland	0	No
Virginia	0	No
North Carolina	0	No
South Carolina	0	No
Georgia	0	No
Florida	0	No
Alabama	0	No
Mississippi	0	No
Louisiana	0	No
Arkansas	0	No

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Montana	0	No
Wyoming	0	No
Nebraska	0	No
Kansas	0	No
Oklahoma	0	No
Arkansas	0	No
Missouri	0	No
Illinois	0	No
Indiana	0	No
Ohio	0	No
Pennsylvania	0	No
Delaware	0	No
Maryland	0	No
Virginia	0	No
North Carolina	0	No
South Carolina	0	No
Georgia	0	No
Florida	0	No
Alabama	0	No
Mississippi	0	No
Louisiana	0	No
Texas	0	No
New Mexico	0	No
Arizona	0	No
California	0	No
Nevada	0	No
Utah	0	No
Colorado	0	No
South Dakota	0	No
North Dakota	0	No
Minnesota	0	No
Wisconsin	0	No
Michigan	0	No
Illinois	0	No
Indiana	0	No
Ohio	0	No
Pennsylvania	0	No
Delaware	0	No
Maryland	0	No
Virginia	0	No
North Carolina	0	No
South Carolina	0	No
Georgia	0	No
Florida	0	No
Alabama	0	No
Mississippi	0	No
Louisiana	0	No
Texas	0	No
New Mexico	0	No
Arizona	0	No
California	0	No
Nevada	0	No
Utah	0	No
Colorado	0	No
South Dakota	0	No
North Dakota	0	No
Minnesota	0	No
Wisconsin	0	No
Michigan	0	No
Illinois	0	No
Indiana	0	No
Ohio	0	No
Pennsylvania	0	No
Delaware	0	No
Maryland	0	No
Virginia	0	No
North Carolina	0	No
South Carolina	0	No
Georgia	0	No
Florida	0	No
Alabama	0	No
Mississippi	0	No
Louisiana	0	No
Texas	0	No
New Mexico	0	No
Arizona	0	No
California	0	No
Nevada	0	No
Utah	0	No
Colorado	0	No
South Dakota	0	No
North Dakota	0	No
Minnesota	0	No
Wisconsin	0	No
Michigan	0	No
Illinois	0	No
Indiana	0	No
Ohio	0	No
Pennsylvania	0	No
Delaware	0	No
Maryland	0	No
Virginia	0	No
North Carolina	0	No
South Carolina	0	No
Georgia	0	No
Florida	0	No
Alabama	0	No
Mississippi	0	No
Louisiana	0	No
Texas	0	No
New Mexico	0	No
Arizona	0	No
California	0	No
Nevada	0	No
Utah	0	No
Colorado	0	No
South Dakota	0	No
North Dakota	0	No
Minnesota	0	No
Wisconsin	0	No
Michigan	0	No
Illinois	0	No
Indiana	0	No
Ohio	0	No
Pennsylvania	0	No
Delaware	0	No
Maryland	0	No
Virginia	0	No
North Carolina	0	No
South Carolina	0	No
Georgia	0	No
Florida	0	No
Alabama	0	No
Mississippi	0	No
Louisiana	0	No
Texas	0	No
New Mexico	0	No
Arizona	0	No
California	0	No
Nevada	0	No
Utah	0	No
Colorado	0	No
South Dakota	0	No
North Dakota	0	No
Minnesota	0	No
Wisconsin	0	No
Michigan	0	No
Illinois	0	No
Indiana	0	

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October 1, 1937

No. 8

THE MORE IMPORTANT RECORDS FOR SEPTEMBER

At the last of September grasshoppers were still doing damage from Illinois to southern Minnesota and southward to Missouri and Oklahoma. They also continued to be destructive in the Great Basin. Over much of the infested territory egg laying was well under way.

Scattering reports of damage by wireworms were received from Pennsylvania, North Dakota, and Washington.

During the month outbreaks of the garden webworm occurred in Indiana and Michigan. The principal damage was to alfalfa.

Hessian fly is abundant in volunteer wheat in parts of Ohio, Wisconsin, North Dakota, and eastern Missouri.

Infestation by the European corn borer in 10 counties in Wisconsin was found during the summer. The insect is building up heavy populations in western Pennsylvania.

Heavy damage to small grain and alfalfa seed by Say's stinkbug was reported from Utah and Arizona.

Late in summer a large codling moth population developed from northern Ohio to northeastern Kansas.

The flatheaded apple tree borer was seriously damaging apple trees from Indiana and Nebraska southward to Oklahoma and Missouri.

The oriental fruit moth was more abundant in Ohio than it has been for several years. It was also reported as abundant in Connecticut and as doing some damage in Georgia and Mississippi.

Heavy infestations of the grape leafhopper were reported from Kern County, Calif., and of the grape leaf folder from the San Joaquin Valley.

The walnut caterpillar was reported in destructive numbers from Virginia to Florida and westward to Wisconsin and Oklahoma.

The Mexican bean beetle became abundant in extreme northwestern New York, in Virginia, Ohio, and Indiana, also in the Gulf region.

The harlequin bug is building up heavy populations in southeastern Virginia.

The corn ear worm was reported as causing commercial damage to peanuts in Oklahoma. This is the first report of serious damage by this insect to this crop in Oklahoma.

The worst infestation of tobacco by hornworms ever reported from Maryland occurred this year. Damage was most serious in southern Maryland, where entire fields were stripped before harvest, and severe damage was later done in the tobacco barn.

Infestation by the pink bollworm in the Big Bend area of Texas was heavier and earlier this year than last.

Late in the season considerable defoliation and ragging of cotton by the cotton leaf worm occurred over much of the Cotton Belt.

The bollworm was quite generally prevalent from Georgia to Texas, although upland cotton was practically made before worms became very numerous. Serious damage, however, occurred in parts of Texas.

The locust leaf miner occurred in outbreak numbers in Virginia and North Carolina.

The larch sawfly is at a very low ebb in the Lake States.

The European spruce sawfly has increased to alarming numbers throughout the northern part of the New England States.

Severe damage to lawns by the hairy chinch bug was reported from New York, Connecticut, Rhode Island, and Ohio.

An unusual number of reports from the northeastern fourth of the United States indicates an outbreak of fleas.

THE MORE IMPORTANT ENTOMOLOGICAL FEATURES IN CANADA
FOR AUGUST And SEPTEMBER

The light and patchy grasshopper outbreak in southwestern Manitoba was greatly aggravated late in July and early in August by extensive flights of grasshoppers from the southeast, with the result that much head damage was done to late crops and prospects of a severe outbreak in 1938 were considerably increased. In Saskatchewan heavy migrations of grasshoppers in southern areas and their concentrations on late crops elsewhere continued to reduce feed supplies. Preliminary surveys revealed important infestations practically throughout the agricultural area. While these were light in many newly infested areas, the area of severe outbreak had also spread markedly, especially in the northwest. Exceptionally severe and general outbreaks are indicated in the Province for next spring. Severe damage and crop loss occurred in some localities in southern Alberta. Although 1937 was a peak year for grasshopper abundance in the interior of British Columbia, crop losses were small as a result of control efforts.

Moderate infestations of the Mormon cricket were reported in several localities in Manitoba and Alberta.

Outbreaks of the armyworm occurred in parts of eastern Canada and the Prairie Provinces. The outbreak in Nova Scotia and Prince Edward Island was the worst in nearly two decades. Moderate-to-light infestations developed in New Brunswick and southwestern Ontario. With the exception of the southwestern municipalities and a strip eastward along the international boundary as far as Manitoba, practically the whole agricultural area of Manitoba suffered heavy infestations. Outbreaks of different degrees of severity also occurred in Saskatchewan.

Extensive damage to field and garden crops by second-year white grubs occurred over a wide area in southern Quebec.

Considerable loss of wheat from the attacks of the wheat stem sawfly was reported in the prairie sections of Saskatchewan wherever crops matured. Losses in Alberta this season were more extensive and severe than in 1936.

A gradual resurgence of the hessian fly population is occurring in southern Ontario, owing to the practice of early seeding.

Say's stinkbug is quite abundant in Alberta and occurs over a wide area in this Province and Saskatchewan. The area extends from the international boundary, west to Cardston, Alberta, east to East Poplar, Saskatchewan, and north to Calgary, Alberta, and Alesask and Ardath, Saskatchewan.

An outbreak of the beet webworm of probably unprecedented severity and

widespread distribution developed in Saskatchewan and increased the seriousness of the feed situation in drought areas by destroying weed growth otherwise available for feed. Outbreaks also occurred in southern Alberta.

Field beans in southern Ontario were infested with the green clover worm, but not to an extent to cause stripping of the plants.

A general decrease in the abundance of the European earwig in infested areas in British Columbia was reported. Imported parasites of the earwigs have been widely distributed in these sections in recent years.

Injury to apples by the first brood of codling moth was reported to be unusually severe in the Niagara district, the Georgian Bay district, and eastern Ontario.

Aphids affecting orchard trees have nowhere been reported in outbreak form. The apple aphid and the rosy apple aphid were noted as of minor importance this year in the Niagara district.

Outbreaks of the apple and thorn skeletonizer, apparently localized, occurred in parts of northern Nova Scotia and Ontario.

The infestation of second-brood oriental fruit moth was low in the Niagara district. An average twig infestation of 3.4 percent was recorded in young peach orchards. The infestation in southwestern Ontario was higher than in 1936.

The pear leaf blister mite is more prevalent than usual, particularly on young pear trees, in parts of southern Ontario. A local severe outbreak occurred in New Brunswick.

A distinct increase in numbers in the first generation of the European spruce sawfly was general in New Brunswick, and in the centre of the Province large areas were beginning to show defoliation. In Quebec new severe attacks on spruce occurred in Bonaventure County, and heavy samples of larvae were received from Kamouraska and Montmagny Counties. West of the St. Lawrence River the sawfly is now known to extend from Lake Saint John westward to Lake Temiskaming.

The black-headed budworm is evenly distributed and fairly abundant from Saskatchewan to the Gaspé, with local concentrations in northern Algoma.

Increased infestation and damage to balsam fir by the balsam woolly aphid has developed in the Maritime Provinces.

The larch sawfly has increased in numbers in parts of Nova Scotia and New Brunswick. An infestation was discovered south of Silverton, British Columbia, 62 miles farther west than previously recorded.

GENERAL FEEDERS

GRASSHOPPERS (Acrididae)

- Illinois. W. P. Flint (September 20): In most sections of the State there has been a marked decrease in the numbers of grasshoppers from August 20 to September 20. Some sections still have moderately heavy infestations. Egg laying is now in full progress, with the weather ideal for the deposition of eggs.
- Wisconsin. E. L. Chambers (September 20): Practically every county reported serious damage to certain crops--alfalfa, tobacco, orchard, and garden; and 52 out of 71 counties spread more than 10,500 tons of bait. Serious damage is still being reported.
- Minnesota. A. G. Ruggles and assistants (September): Grasshoppers are abundant in the southern third of the State.
- Iowa. H. E. Jaques (September 24): Grasshoppers are still very abundant throughout much of Iowa, but their present damage, with the exception of garden and some other fall crops, has been quite negligible. We have recently taken a number of specimens of Schistocerca lineata Scudd. in Henry County. This is a new record for this species in the eastern half of the State.
- Missouri. L. Haseman (September 23): During September grasshoppers have continued to attract attention; in fact, with the scarcity of rain over most of the State and the shortage of wild vegetation, they have tended to move onto late corn, fruit trees, and garden crops, more perhaps than earlier in the summer. Through central Missouri, Melanoplus mexicanus Sauss. is now by far the most abundant and active species. The second brood is maturing, mating, and laying eggs at this time. M. differentialis Thos. is present in numbers around the edges of cornfields and other tall vegetation, and likewise is mating and ovipositing. Since about the first of September very few of the two-lined grasshoppers (M. bivittatus Say) have been observed. Unusual numbers of the Carolina locust (Dissosteira carolina L.) have been collecting in bare places, being more abundant than I have seen them any time during the past several years. Our common red-legged grasshopper (M. femur-rubrum Deg.) in central Missouri, appears with M. mexicanus at the rate of about 1 to 10 of mexicanus.
- Kansas. H. R. Bryson (September 25): Grasshoppers are still quite abundant and are a threat to the early sown wheat. Alfalfa fields in localities of very low rainfall have been considerably injured. Egg deposition is taking place at a rapid rate.
- Nebraska. M. H. Swenk (September 22): While the corn crop has passed the stage where grasshoppers may damage it seriously, damage has been rather heavy to late summer seedings of alfalfa and the early seedings of winter wheat and rye. Over 1,000 tons of bait materials have been used in the last 30

days. Use of bait has been particularly heavy in the southwestern and western third of the State, although large quantities have been used throughout the entire winter wheat-growing section.

Oklahoma. C. F. Stiles (September 18): Grasshoppers are congregating in most places and depositing eggs. However, on the west side of the State they are doing serious damage to fall-planted wheat. Alfalfa is also being seriously damaged in some of the central counties. Considerable poisoning is being done in the western counties. The species most common are M. differentialis and M. mexicanus.

Utah. C. J. Sorenson (September 20): M. femur-rubrum is very abundant in Millard, Cache, and Box Elder Counties. M. packardii Scudd. is very abundant in Sanpete, Cache, Juab, and Millard Counties. M. bivittatus is very abundant in Sanpete, and M. mexicanus in Tooele, Millard, and Juab Counties. Camnula pellucida Scudd. is very abundant in Tooele County.

G. F. Knowlton (September 10): Grasshoppers are more abundant in most parts of Cache County than they have been for several years. They are damaging alfalfa seriously in North Farmington, east of Layton, and southwest of Salt Lake City, in northern Utah. Eight hundred acres of alfalfa and several thousand acres of range land were heavily infested on ranches along Indian Creek, in San Juan County.

WIREWORMS (Elateridae)

Pennsylvania. M. D. Leonard (September 22): Reported to have been very injurious to various vegetable crops, especially tomatoes, in Chester County this summer.

North Dakota. J. A. Munro (September 17): A survey has been conducted in potato fields in Traill, Grand Forks, Walsh, and Pembina Counties. Some fields show only a small percentage of the tubers injured, while others in nearby areas show injury as high as 68 percent. The most serious infestations have been found in the Hoople and Crystal vicinities of Walsh and Pembina Counties. The predominating species appears to be Ludius aereipennis Kby.

Washington. E. W. Jones (September 23): Limonijs canus Lec. was found to be damaging fall spinach and lettuce early in September at Walla Walla.

JAPANESE BEETLE (Ponillia japonica Newm.)

Connecticut. W. E. Britton (September 23): Several cases of rather severe grub injury to lawns have come to our attention. Heretofore most of the damage has been caused by the adults to foliage and flowers. Adults have been received for identification from Greenwich, New Haven, and Woodmont, and several lots of larvae from New Haven.

New Jersey. C. W. Hadley (August): Heretofore feeding by beetles on the fruit of grapes has not been observed, and it was thought that such feeding did not occur. However, on August 13, extensive feeding by beetles on bunches of grapes was observed in a vineyard at Holmdel.

ASIATIC GARDEN BEETLE (Autoserica castanea Arrow)

Connecticut. W. E. Britton (September 23): Grubs are now injuring lawns, often in association with those of Anomala orientalis Wtrh. and P. japonica, particularly in the New Haven region.

ORIENTAL BEETLE (Anomala orientalis Wtrh.)

Connecticut. W. E. Britton (September 23): The grubs of this insect continue to damage untreated lawns in New Haven and West Haven. Many separate lots of grubs have been received for identification and information regarding treatment.

WHITE-FRINGED BEETLE (Naupactus leucoloma Boh.)

Alabama. J. M. Robinson (September 19): Adults are still depositing eggs in the infested area in Covington and Geneva Counties. Some have deposited as many as 1,400 eggs.

FULLER'S ROSE BEETLE (Pantomorus godmani Crotch)

Georgia. T. L. Bissell (September 17): This weevil is abundant, possibly abnormally so, feeding on Lespedeza bicolor, soybeans, and coffee weed at Experiment.

A TENEBRIONID (Pelecyphorus densicollis Horn)

Washington. M. H. Hatch (September 22): Enormous numbers of adults were seen swarming in the sagebrush just east of Prosser on September 20. At times in the past this species has been so abundant as to clog irrigation ditches between Prosser and Kennewick.

A FALSE WIREWORM (Eleodes sp.)

Kansas. H. R. Bryson (September 26): The false wireworm has been reported causing considerable injury to wheat in Kansas, as far east as Saline. Deficient rainfall in the wheat district and much early sown wheat are contributing to the amount of injury.

ARMYWORM (Cirphis unipuncta Haw.)

Maine. H. B. Peirson (September 14): A large flight of moths occurred at Bar Harbor August 25.

Rhode Island. A. E. Stene (September 21): Late in August we had an outbreak of armyworms in Providence County, more severe than the earlier ones in Kent and Washington Counties. A large millet field was destroyed, and the caterpillars marched to an adjoining field which fortunately was an old pasture where they found little food. Here also parasitic flies were abundant and hardly a caterpillar could be found without from 1 to 10 or even 15 eggs attached.

Oklahoma. F. A. Fenton (September 20): Armyworms and several species of cutworms are unusually numerous and are cutting down the young wheat plants in many fields.

WHITE-LINED SPHINX (Sphinx lineata F.)

Maine. H. B. Peirson (August): This moth has been seen abundantly this year hovering over flowers in gardens in central and southern Maine. Numerous inquiries have also been received concerning it from various places in the State, it being often mistaken for a hummingbird.

Michigan. R. Hutson (September 20): Has been reported from all over the State.

Iowa. H. E. Jaques (September 24): Has been very abundant in both the larval and adult stages throughout the State. The larvae in many cases are feeding on purslane and other weeds, so that their presence has not created a serious problem.

CEREAL AND FORAGE-CROP INSECTS

WHEAT

HESSIAN FLY (Phytophaga destructor Say)

Ohio. T. H. Parks (September): While the infestation in the 1937 wheat crop was very light, eggs are now abundant on volunteer wheat in some counties showing a very low infestation in July.

Wisconsin. E. L. Chambers (September 20): Once so abundant that it resulted in the abandoning of winter wheat raising in the State, the hessian fly is making its appearance on grain after many years' absence. Eggs and larvae observed on volunteer grain in Dane and Jefferson Counties.

North Dakota. J. A. Munro (August 6): Specimens collected on one of the Station plots at Fargo. Some of the plots are infested as high as 50 percent--Hope Reward cross. (September 17): An examination of most of the varietal wheat plantings on the station grounds brought the average infestation rather low, about 4 percent.

Missouri. L. Haseman (September 23): Summer and fall stubble surveys indicate a scarcity of live flaxseeds over a considerable part of Missouri. However, throughout the northeastern and most of the eastern and southeastern parts of the State they are present in sufficient numbers to cause worry, where growers found conditions favorable for seeding early. Over most of the State, however, scarcity of rainfall is holding back seeding or, at least, wheat sprouting, so that it now appears that comparatively little wheat in this State will be up and exposed to flies even where they are abundant enough to cause worry.

Kansas. H. R. Bryson (September 25): Hessian fly is not depositing eggs at this writing.

CHINCH BUG (Blissus leucopterus Say)

Illinois. W. P. Flint (September 20): Very spotted and moderately heavy infestations of chinch bugs exist in many small areas in the south-central and southern parts of the State. The latter part of August and first of September have been very dry, and while these insects appeared late in the season they are in most cases developed sufficiently to enable them to hibernate in the adult stage.

Kansas. H. R. Bryson (September 25): Chinch bugs are present in considerable numbers in sorghum fields but are doing no damage.

APPLE GRAIN APHID (Rhopalosiphum prunifoliae Fitch)

Nebraska. M. H. Swenk (September 22): Wheat plants in Frontier County are being killed out by the apple grain aphid.

Correction--In the Insect Pest Survey Bulletin Vol. 17, September 1, 1937, No. 7, page 342, regarding the sawfly in Ohio, by E. J. Udine, the heading should read Black Grain Stem Sawfly (Trachelus tabidus F.), instead of European Wheat Stem Sawfly (Cephus pygmaeus L.)

CORN

CORN EAR WORM (Heliothis obsoleta F.)

Pennsylvania. M. D. Leonard (September 22): C. A. Thomas reports that corn ear worm was scarce in eastern Pennsylvania this season.

Illinois. W. P. Flint (September 20): A heavy infestation developed late, building up to a maximum during September.

Wisconsin. E. L. Chambers (September 20): Has been reported doing damage to chrysanthemums in several commercial florist establishments in Milwaukee.

Tennessee. L. B. Scott (September 3): Very abundant in central Tennessee. Damage has been severe in corn and tomatoes, but probably more severe in corn.

Kansas. H. R. Bryson (September 25): Abundant in sorghum heads.

Utah. G. F. Knowlton (September 6): Infestation was heavy in corn, but to date rather light in tomatoes at Castle Dale and Huntington. Corn ear worms have damaged most of the sweet corn at Duchesne and Price, and 10 percent of the tomatoes were damaged in one field examined at Price.

EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

Connecticut. N. Turner (September 20): Late sweet corn at the Mt. Carmel Farm

was unusually heavily infested, about 90 percent of the ears being attacked. We have several reports of similar damage in southern Connecticut. Unsprayed dahlias were also heavily infested, dissections showing as many as 73 borers in a single plant. Many second-instar larvae are present and a few cast pupal skins, indicating that there may be a partial third generation this year. Injury to gladiolus has been reported, and larvae in stalks received from Westport.

Pennsylvania. R. M. Baker (September): The infestation in Erie and Crawford Counties has been building up until, on a recent survey, 30 percent of the cornstalks in some fields were found to be infested. The infestations in Centre, Clinton, and Lycoming Counties are showing only a very slight increase.

Wisconsin. E. L. Chambers (September 20): More than 60 fields of corn were found infested in 10 counties bordering on Lake Michigan.

CORN ROOTWORM (Diabrotica longicornis Say)

Connecticut. W. E. Britton (September 21): Adults damaged corn by shredding the husks and eating the kernels at Lakeville. Twelve were submitted for identification.

ALFALFA

GARDEN WEBWORM (Loxostege similis Guen.)

Indiana. J. J. Davis (September 25): More abundant and destructive to alfalfa than for a number of years, destroying a large acreage of this year's sowing of alfalfa in the northern two tiers of counties. The first report came from Lagrange County, August 26, and by September 2 the webworms had eaten three-fourths of all the new alfalfa seeding in the county. Reports continued through the month of September, most of them coming in early September.

Michigan. R. Hutson (September 20): The garden webworm is destroying alfalfa seedlings in southern Michigan.

Oklahoma. C. F. Stiles (September 18): Has completely defoliated many of the alfalfa fields throughout the central part of the State. Cotton in some instances has also been damaged and where food has been scarce, this pest has fed on a variety of plants. This is one of the worst outbreaks that has ever been observed in Oklahoma.

ALFALFA CATERPILLAR (Eurymus eurytheme Bdv.)

California. C. S. Morley (September 3): The butterflies were very numerous and in the Kern Lake district larvae injured half-grown alfalfa to the extent that several hundred acres had to be cut before maturity in order to stop the invasion.

ALFALFA WEEVIL (Hypera postica Gyll.)

Utah. C. J. Sorenson (September 20): Alfalfa weevil very abundant in Piute County. Serious damage in 1937.

California. A. E. Michelbacher (September 20): Larval and adult populations continue to be very small. In the San Joaquin Valley on September 17 a few individuals were collected in two fields, while in the San Francisco Bay area a few were taken in a single field.

GRAPE COLASPIS (Colaspis brunnea F.)

Arizona. H. F. Tate (September 20): There has been a serious outbreak of this beetle on seed alfalfa this fall. There are 10,000-12,000 acres of seed alfalfa in Yuma County.

SAY'S STINKBUG (Chlorochroa sayi Stal)

Utah. C. J. Sorenson (September 20): Severe damage; 50 percent to barley and considerable damage to first-crop alfalfa seed in New Castle, Iron County, and in Millard County. Moderately abundant to very abundant. In Washington County, moderately abundant, with damage to sugar-beet seed.

Arizona. C. D. Lebert (September 2): Inspector Mendenhall reports 30 to 35 percent injury to seed alfalfa from C. sayi and plant bug, Lygus sp., injury in the Gila Valley and near Safford.

TARNISHED PLANT BUG (Lygus pratensis L.)

Arizona. H. F. Tate (September 20): There has been a serious outbreak of the tarnished plant bug on seed alfalfa this fall.

POTATO LEAFHOPPER (Empoasca fabae Harr.)

Kentucky. W. A. Price (September 24): Severe leafhopper injury to alfalfa in the northern section of the State.

CLOVER

GREEN CLOVER WORM (Plathypena scabra F.)

Ohio. N. F. Howard (September 20): At Columbus during the early part of August green clover worm was rather scarce, but in September it was found to be quite numerous, although not as abundant as some years.

FRUIT INSECTS

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

Ohio. T. H. Parks (September): Codling moth developed into a problem principally in Lawrence County on the Ohio River, and in Lucas and Ottawa Counties in northern Ohio. The month of August was dry, and bait-pan catches at Columbus and Toledo showed increased moth activity between August 10 and 20. This was followed by injurious entrances after the middle of August. Orchards checked in central and eastern Ohio show very low infestation.

Michigan. R. Hutson (September 20): The second brood was not so severe as was expected.

Missouri. L. Haseman (September 23): During September there has been a steady emergence of third-brood moths with an unusually sharp pickup in abundance in northwestern Missouri during the last few days of August.

Missouri and Kansas. H. Baker (August 31): The second brood appears to have caused more damage in northwestern Missouri and northeastern Kansas than any other one brood since the spring brood of 1934. Well sprayed orchards show many stings and poorly sprayed ones are very wormy. Greatly increased bait-traps catches of moths which began August 27, indicate that third-brood damage may be heavy if weather conditions are favorable.

YELLOW-NECKED CATERPILLAR (Datana ministra Drury)

Missouri. L. Haseman (September 23): A second generation appeared in September. The larvae are now largely full fed and where the foliage of apple has not had a good spray coverage a good deal of damage to the foliage has been done.

APPLE LEAFHOPPERS (Cicadellidae)

Massachusetts. M. D. Leonard (September 22): Leafhoppers, Typhlocyba pomaria McAtee, are very injurious in at least one large orchard in the State and presumably abundant in others, according to an authentic report received during August.

Connecticut. P. Garman (September 21): Infestation by the white apple leafhopper (T. pomaria) is irregular; some orchards heavily infested, others not at all.

Virginia. A. M. Woodside (September 20): The white apple leafhopper is present in large numbers in many orchards of Augusta County, but no severe infestations have been observed.

Missouri. L. Haseman (September 23): During September the various species of leafhoppers on apple have been unusually abundant and injurious to the foliage. There seems to have been a rapid increase of leafhoppers during

the last few weeks. This, combined with the scarcity of rain, caused considerable drop of the Jonathan apples early in September, though during the middle and latter part of September where Jonathans were not picked, the dropping of the fruit largely stopped.

FLATHEADED APPLE TREE BORER (Chrysobothris femorata Oliv.).

Indiana. J. J. Davis (September 25): Continues to be reported from many parts of the State damaging apple and maple.

Missouri. L. Haseman (September 23): Although adults were more abundant earlier in the summer than we have ever seen them in Missouri, there is really less damage showing up during September than occurred during the past two or three falls. Unfortunately, there are plenty of the borers in weakened trees and developing on limbs and exposed trunks in healthy trees, but far less than we expected.

Nebraska. M. H. Swenk (September 22): Complaints of damage to fruit and shade trees, principally ash, elm, willow, and flowering crab apple, were received from August 20 to September 22 from several counties.

Oklahoma. F. A. Fenton (September 20): Continues to be the most important tree-boring insect on shade trees. Reports are being received from widely scattered parts of the State.

ROUNDHEADED APPLE TREE BORER (Saperda candida F.)

Missouri. L. Haseman (September 23): At Columbia the young larvae hatched during August and by early September most of them were through the outer bark feeding on the cambium. By the middle of September, many of these had developed tunnels 2 and 3 inches in length, and the grubs were over $\frac{1}{2}$ inch long. In some orchards they have been unusually abundant, and where not removed promptly seriously damaged both young and bearing trees.

PEACH

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Georgia. O. I. Snapp (September 4): Jarring records showed a considerable increase in adult curculios in peach orchards at Fort Valley, central Georgia, early in September. An average of 1.5 beetles per tree were taken by jarring on September 4. This is more than at any time since April 3, when adults were appearing from hibernation. Weather conditions have been favorable for the development of the second generation, and the sudden increase of adults in peach orchards is believed to be due largely to the recent emergence of second-generation adults from the soil. Many of the beetles caught on September 4 were clean and looked to be new individuals. Seventy percent of the first-generation females deposited second-generation eggs, which is more than usual.

Nebraska. M. H. Swenk (September 22): Reported attacking plums in Sheridan County, September 6.

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Connecticut. P. Gorman (September 21): Infestation in fruit varies from 10 percent or less to 50 percent.

Georgia. O. I. Snapp (September 9): Attacked flowering peach trees planted on streets of Fort Valley. Many terminals of these trees have been damaged.

Ohio. T. H. Parks (September): More abundant than for several years. The Elberta peach crop was infested in varying degrees, 1 bushel analyzed at Columbus showing 26 percent of the fruits carrying larvae.

Mississippi. C. Lyle (September 24): Complaints of injury to peach twigs were received from Waynesboro on August 31 and from Minter City on September 2.

PEACH BORER (Conopia exitiosa Say)

Georgia. O. I. Snapp (September 9): Weather conditions have been favorable for the development of adults during the last month in central Georgia. The general infestation is moderate.

Michigan. R. Hutson (September 20): Numerous at St. Joseph, Eau Claire, South Haven, Paw Paw, and Grand Rapids.

Missouri. L. Haseman (September 23): Surprisingly scarce in peach trees throughout central Missouri.

RASPBERRY AND BLACKBERRY

RASPBERRY CANE BORER (Oberea bimaculata Oliv.)

Wisconsin. E. L. Chambers (September 20): Has been found quite generally distributed on raspberry by the nursery inspectors this summer.

PACIFIC MITE (Tetranychus pacificus McG.)

California. C. L. Quick (August 6): Found on native species, Rubus parviflorus, on river flat at elevation of about 4,800-4,900 feet in Mt. Diablo, Stanislaus National Forest, Tuolumne County. The damage noted was general yellowing and defoliation.

GRAPE

GRAPE LEAFHOPPER (Erythroneura comes Say)

Missouri. L. Haseman (September 23): During the last days of August and throughout September, leafhoppers on grapes increased greatly in numbers in central Missouri and leaves on the more susceptible varieties were badly spotted by feeding. Late sprays, however, largely eliminated the brood of immature hoppers.

Utah. G. F. Knowlton (September 10): Have killed from 50 to 95 percent of

the leaves on most Virginia creepers observed recently in northern Utah. Certain varieties of grapes have been similarly damaged.

California. C. S. Morley (September 3): Severely injured vineyards in the northern part of Kern County. Some growers are still dusting for protection to the later varieties.

GRAPE LEAF FOLDER (Desmia funeralis Wbn.)

California. R. E. Campbell (September 11): Becoming injurious again in Tulare and Fresno Counties. Last year very serious damage was done to more than 100 acres, and at present at least 1,000 acres are threatened.

A GRAPE LEAF SKELETONIZER (Morrisina sp.)

Arizona. M. D. Leonard (September 22): H. F. Tate, of the University of Arizona, writes under date of September 17 that only one small outbreak of the grape leaf skeletonizer occurred this season.

GRAPE THRIPS (Drepanothrips reuteri Uzel)

California. S. F. Bailey (September 1): Rather severe injury has shown up to grapes in the San Joaquin Valley.

CURRENT

CURRENT APHID (Myzus ribis L.)

Utah. G. F. Knowlton (September 2): Red currant leaves are heavily infested and badly cupped at Oakley.

PECAN

PECAN WEEVIL (Curculio caryae Horn)

Georgia. O. I. Snaps (September 3): Abundant on pecan at Fort Valley, central Georgia. As many as 15 were taken from 4 trees today by jarring.

PECAN INSECTS (Lepidoptera)

Florida. J. R. Watson (September 22): The pecan nut casebearer (Aerobasis caryae Grote) and the hickory shuck worm (Laspeyresia caryana Fitch) are doing about their usual amount of damage to pecans.

WALNUT

WALNUT CATERPILLAR (Detana interrima G. & R.)

Virginia. C. R. Willey (September 17): Much more numerous in Richmond and vicinity than usual. The hosts attacked were black walnut, English walnut, and pecan.

Florida. J. R. Watson (September 22): Somewhat scarcer than usual.

Kentucky. W. A. Price (September 24): A high percentage of walnut trees throughout the State show damage.

Wisconsin. E. L. Chambers (September 20): Walnut trees throughout southern Wisconsin were completely defoliated late in August and early in September.

Missouri. L. Haseman (September 23): Throughout practically the entire State the second-generation larvae ate the foliage from walnut, hickory, and pecan trees. Early in September larvae forced to migrate in search of food in central Missouri fairly carpeted the ground around walnut trees that were stripped. Many medium-sized trees had from 15 to 50 colonies of these worms feeding on them. This insect has been serious in recent years but never has it done the damage that it did this fall. The season is late enough so that no serious injury will be done to the trees. In many places the larvae were so abundant that most of the later colonies died of starvation, though great numbers have gone into winter quarters.

Oklahoma. C. F. Stiles (September 18): The second brood has defoliated a large percentage of the pecan and walnut trees throughout the State. This is the second time that these trees have been defoliated this season. The growers are considerably worried about the future of the pecan industry as many of the trees are weakened and will die during the coming year.

Mississippi. C. Lyle (September 24): Specimens were received from Shuqualak on September 16 and from Grenada on September 21.

CITRUS

CITRUS THRIPS (Scirtothrips citri Moul.)

California. R. S. Woglum (September): Causing severe damage in many lemon groves, especially in the interior areas from San Fernando to Corona. In not a few orchards this insect is having a greater influence on the coming set of lemons than all other pests combined.

CITRUS WHITEFLY (Dialeurodes citri Ashm.)

Alabama. J. M. Robinson (September 19): Abundant in central and southern Alabama.

Louisiana. H. L. Dozier (August): Very abundant on young lemon foliage at Opelousas.

LEAF-FOOTED BUG (Leptoglossus phyllopus L.)

Florida. J. R. Watson (September 22): Attacking ripening Satsumas as usual.

CALIFORNIA RED SCALE (Chrysomphalus aurantii Mask.)

California. R. S. Woglum (September): Many orange and lemon orchards through-

out the warmer foothill areas are showing a heavy scale increase, and in the case of oranges, the scale is pitting the fruit.

FLORIDA RED SCALE (Chrysomphalus aonidum L.)

Louisiana. I. J. Becnel (September): A light infestation was found in the State University Satsuma grove at Baton Rouge.

COTTONY-CUSHION SCALE (Icerya purchasi Mask.)

Mississippi. C. Lyle (September 24): H. Gladney reports 4 light infestations in Harrison County. The scale is also present in Jackson.

CITRUS RUST MITE (Phyllocoptes oleivorus Ashm.)

Louisiana. I. J. Becnel (September): Infestations are severe in many groves in Plaquemines Parish. They are especially heavy in neglected groves.

T R U C K - C R O P I N S E C T S

VEGETABLE WEEVIL (Listroderes obliquus Klug)

Alabama. J. M. Robinson (September 19): The vegetable weevil is moderately abundant.

Mississippi. C. Lyle (September 24): One specimen of the vegetable weevil, taken from cotton at Decatur, was sent to this office on September 7.

SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata F.)

North Carolina. Z. P. Metcalf (September 20): Damage severe in the western half of the State, principally to dahlias and roses.

Georgia. T. L. Bissell (September 16): From one to five beetles were caught nightly in a trap at Experiment.

Florida. M. D. Leonard (September 22): Reported to me recently as doing considerable damage to several vegetable crops south of Miami.

Ohio. T. H. Parks (September): Over 50,000 of these beetles were caught in 1 electric light trap between August 15 and September 10 at Columbus. The trap was exposed near plantings of corn.

N. F. Howard (September 20): Very abundant in central Ohio during the season. In one instance larvae were in lima bean pods that were touching the soil.

Missouri. L. Haseman (September 23): During the early part of September there were heavy swarms of both striped (D. vittata F.) and spotted cucumber beetles throughout central Missouri. At present they are feeding on the silks of late corn and are boring into beans. Some are eating holes in apples.

CARROT BEETLE (Ligyrus gibbosus Deg.)

Kansas. H. R. Bryson (September 25): This insect has caused some injury in Kansas practically all summer. A recent report was received from Spearville, where it was injuring root crops, zinnias, marigolds, and other flowers. Unusually abundant at lights all the year.

Washington. R. S. Lehman (September 23): The carrot beetle has been doing considerable damage to fall lettuce in the vicinity of Walla Walla. The adults are chewing the roots of the plants.

SOUTHERN GREEN STINKBUG (Nezara viridula L.)

Louisiana. C. L. Stracener (September): Green stinkbugs are severely injuring late peas.

FALSE CHINCH BUG (Nysius ericae Schill.)

Utah. G. F. Knowlton (September 8): False chinch bugs have damaged grain, spinach, peas, and several other garden crops in parts of Sanpete and Emery Counties.

MOLE CRICKETS (Gryllidae)

Florida. J. R. Watson (September 22): Mole crickets are doing their usual damage to truck-crop seedbeds that are being prepared for the winter season.

Louisiana. C. L. Stracener (September): Mole crickets have been reported as seriously injuring fall gardens.

POTATO AND TOMATO

HORNWORMS (Protoparce spp.)

California. J. C. Elmore (September 21): The tomato hornworm was destructive to tomato plants near San Dimas. From one to three larvae were present on every plant.

Utah. G. F. Knowlton (September 6): Tomato hornworms are damaging tomato vines at Castle Dale and Huntington, in Emery County.

CORN EAR WORM (Heliothis obsoleta F.)

California. A. E. Michelbacher (September 20): In a part of central California the larvae are seriously infesting tomatoes. In Yolo and Sacramento Counties, despite rather extensive control programs, the infestation in many fields ranged from 10 to 20 percent. In one field near Davis the infestation was slightly more than 40 percent. In other areas, such as the Brentwood and Gilroy districts, most of the infestations are small.

TOMATO PINWORM (Gnorimoschema lycopersicella Busck)

California. J. C. Elmore (September 21): Most of the tomato fields in southern

California

contain only a trace of pinworm, with few cases of actual commercial damage at this time. Maximum infestations have reached only 15 to 35 percent in the Riverside, Santa Ana, San Pedro, and San Fernando areas.

POTATO PSYLLID (Paratrioza cockerelli Sulc.)

Arizona. M. D. Loenard (September 22): H. F. Tate, under date of September 17, writes that the potato psyllid did not show up in sufficient numbers to justify control measures.

Utah. G. F. Knowlton (September 18): Damage has not been severe in northern Utah up to this time.

POTATO APHID (Illinoia solanifolii Ashm.)

New Jersey. T. L. Guyton (September 15): Numerous on tomato plants.

PEAS

MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

Rhode Island. A. E. Stone (September 21): Present in about usual numbers.

New York. N. Y. State Coll. Agr. News Letter (September 21): A correspondent from Niagara Falls sent specimens on September 14, with the statement that the insects had all but destroyed his snap beans. This indicates that this pest has reached the northwestern section of the State in destructive numbers.

Virginia. H. G. Walker (September 25): Very abundant in many bean fields in Elizabeth City County and rather abundant in some fields around Norfolk and on the Eastern Shore of Virginia.

Ohio. N. F. Howard (September 20): It has been more numerous in central Ohio than average, but probably not as injurious as it was some years ago. Along the Ohio River at South Point, the beetle was extremely numerous and injurious earlier in the season, but a small area in that section suffered from drought and heat during August and the early part of September and the infestation was greatly reduced.

Indiana. J. J. Davis (September 25): Has ruined crops in scattered localities in the State. There has been a gradual increase as the season advanced and perhaps the pest is prepared to pass the winter in larger numbers than for several years.

Alabama. J. M. Robinson (September 19): The Mexican bean beetle is moderately abundant at Auburn.

Mississippi. L. G. Goodgame (September 24): Causing heavy losses of beans in the northeastern part of the State.

Utah. G. F. Knowlton (September 6): Injury was present but light in Castle Dale,

Emery County. In Carbon County, central Utah, the insect has completely defoliated many patches of green and pole beans at Price and has caused considerable damage at Wellington.

C. J. Sorenson (September 20): Mexican bean beetle moderately abundant in Santa Clara, Washington County, southwestern Utah.

BANDED CUCUMBER BEETLE (Diabrotica balteata Lec.)

Georgia. T. L. Bissell (September 16): Two beetles were caught in a light trap at Experiment on August 20 and on September 11. This species is not common in this locality.

Florida. J. R. Watson (September 22): Reported as doing severe damage in the southern part of the State, particularly in Dade County.

Louisiana. L. O. Ellisor (September): At Baton Rouge the banded cucumber beetle has gradually increased in numbers since early spring and is by far the most abundant and destructive species of Diabrotica present. Damage to fall-planted beans and potatoes is particularly severe and in some areas control measures are being applied.

California. J. C. Elmore (September 21): Numerous on string-bean foliage, skeletonizing the leaves, at Santa Ana, Orange County.

BEAN LEAF SKELETONIZER (Autographa egea Guen.)

California. J. C. Elmore (September 21): Numerous on bean foliage at Santa Ana, Orange County. Enough larvae present to soon cause complete defoliation.

POTATO LEAFHOPPER (Empoasca fabae Harr.)

Virginia. M. D. Leonard (September 22): Several insecticide dealers recently reported that leafhoppers were abundant on beans on the Eastern Shore this summer, but the amount of actual damage was not determined.

CABBAGE

IMPORTED CABBAGE WORM (Pieris rapae L.)

Michigan. M. D. Leonard (September 22): A severe infestation was reported by correspondence on a large acreage of cabbage at Mentha, presumably from some time in August into at least the early part of September.

Minnesota. A. F. Rumbles and assistants (September): Very abundant in Martin, Kittson, and Washington Counties.

Utah. G. T. Hamilton (September 6): Damage was extensive to cabbage throughout Emery County and worms were damaging cabbage at Price, in Carbon County.

CABBAGE LOOPER (Auto-grapha brassicae Riley)

New York. M. D. Leonard (September 22): The infestation has been general and from moderate to severe on the extensive cauliflower crop in eastern Suffolk County. This started with the fall crop early in August, running through to date, with several short periods of lessening of larval activity because of rains.

Virginia. H. G. Walker (September 25): An outbreak started at Norfolk about 3 or 4 weeks ago, but a high percentage of the loopers died from a disease before they had done much damage.

Michigan. M. D. Leonard (September 22): A severe infestation on a large acreage of cabbage at Mentha was reported, presumably from some time in August into at least the early part of September.

HARLEQUIN BUG (Murgantia histrionica Hahn)

Virginia. H. G. Walker (September 25): Harlequin bugs appear to be more abundant and more generally distributed than they have been for the last 2 years in Norfolk; however, they have not caused much damage.

C. R. Willey (September 17): During the last few days this pest has apparently "swarmed" Richmond flower gardens. We have had several phone calls, and specimens have been brought in, and we have heard indirectly of occurrence in various gardens.

Mississippi. C. Lyle (September 24): Harlequin cabbage bugs were collected on turnips at Starkville on August 30. Complaints of injury to turnips and collards have been received from Tupelo, Grenada, Durant, and Meridian.

SQUASH

SQUASH BUG (Anasa tristis Des.)

Ohio. N. F. Howard (September 20): Moderately abundant at Columbus but not so injurious as in some years.

Missouri. L. Haseman (September 23): During the early part of September there was a rapid increase in the number of squash bugs on late cucumbers and squashes in central Missouri. At this time most of the last generations are in the later nymphal instars and adult stage.

Utah. G. F. Knowlton (September 3): Has destroyed most of the squash plants in gardens at Price, Carbon County. This area has only recently become infested, this being the most severe damage experienced in the county.

C. J. Sorenson (September 20): Very abundant at Ivins, Washington County. Destroyed 90 percent of cantaloupes and other melons.

PICKLEWORM (Diaphania nitidalis Stoll)

Ohio. N. F. Howard (September 20): At Columbus the pickleworm was present on summer squash in the experimental plots earlier in the month.

TURNIP

TURNIP APHID (Rhopalosiphum pseudobrassicae Davis)

Kansas. H. R. Bryson (September 25): Aphids are abundant on turnips.

PEANUTS

CORN EAR WORM (Heliothis obsoleta F.)

Oklahoma. C. F. Stiles (September 18): The foliage of one 12-acre field of peanuts in Okfuskee County has been seriously injured. This is the first time this insect has seriously damaged peanuts in Oklahoma.

A SCARABAEID (Ataenius cognatus Lec.)

Alabama. J. M. Robinson (September 19): Reported attacking peanuts at Dadeville on August 14.

Correction--The beetle damaging turf in Massachusetts, reported in the August 1, 1937, Insect Pest Survey Bulletin (p. 323) as A. cognatus has been determined by O. L. Cartwright as A. falli Hinton, a recently described species.

LETTUCE

ZEBRA CATERPILLAR (Mamestra picta Harr.)

Idaho and Oregon. R. W. Haeghele (September 23): Scattered infestations are appearing in the lettuce fields in Payette and Washington Counties in western Idaho and in Malheur County, eastern Oregon. The larvae range from newly hatched to $\frac{1}{2}$ inch in length and are causing some damage. There are about 1,000 acres of lettuce in the infested district and control is being attempted.

CARROT

SEED-CORN MAGGOT (Hylemyia cilicrura Rond.)

New York. R. W. Leiby (September 7): A heavy infestation all but destroyed a 2-acre field of carrots in Wayne County late in August. The maggots fed on carrots one-third grown. Bred to the adult stage, they proved to be the seed-corn maggot.

PEPPER

PEPPER WEEVIL (Anthonomus eugenii Cano)

California. J. C. Elmore (September 21): The pepper weevil has caused light pepper drop this season, except in a few cases. Two early bell pepper fields near Santa Ana were 100 percent infested on September 15, but the large chili-pepper acreage in Orange and Los Angeles Counties has a good set of early pods beyond weevil attack. Population has built up in late pods but actual losses will not be heavy except in the number-two grade. The infestation was much higher in the San Luis Rey Valley of San Diego County, owing to milder winter temperatures. Treatment has been necessary, untreated fields having suffered heavy losses.

EGGPLANT

A MEMBRACID (Micrutalis calva Say)

Louisiana. H. L. Dozier (September 3): Small green and black treehopper breeding in abundance on eggplant tips at Opelousas. Generally distributed in gardens examined.

A TORTOISE BEETLE (Gratiana pallidula Boh.)

Louisiana. H. L. Dozier (September 3): The small green tortoise beetle appears to be generally distributed in the Opelousas section and is a minor pest of eggplants. Abundant all summer on the foliage.

TOBACCO

HORNWORMS (Protoparce spp.)

Maryland. E. N. Cory (September 24): There has been a heavy and general infestation of the tobacco hornworm throughout parts of the State where tobacco is grown. It has also occurred in considerable numbers on tomatoes, and in one instance on tobacco on the Eastern Shore. The heaviest infestation noticed was in Anne Arundel County, where several entire fields were not cut because they had been stripped. Severe stripping of the tobacco in the barn was reported from Anne Arundel, Prince Georges, and St. Marys Counties. In Anne Arundel County there appeared to be a low degree of parasitization, but reports from Prince Georges County at a later date indicated heavy parasitization.

Tennessee. L. B. Scott (September 3): Hornworms were present in normal numbers early in August, causing moderate damage to tobacco. Continued dry weather has delayed emergence and both species are now less than normally abundant.

TOBACCO BUDWORM (Heliothis virescens F.)

Maryland. M. D. Leonard (September 22): A grower reported that early in September serious damage was done by the budworm, in a 5-acre patch of tobacco south of Washington, D. C.

COTTON INSECTS

BOLL WEEVIL (Anthonomus grandis Boh.)

Georgia. R. M. Gilmer (August 30): In southern and central Georgia weevils are abundant in all fields. In late plantings of short-staple cotton bolls were produced only about one-half way up the plant. Undusted fields of Sea Island cotton show very heavy loss in bolls, while dusted fields show satisfactory control of the late weevils. The third-brood weevils are now emerging in considerable numbers.

W. L. Lowry (August 28): In Lowndes and Echols Counties boll weevils have increased rapidly during the last 2 weeks and practically all fields of Sea Island cotton are devoid of squares, blooms, and young bolls. A fairly good crop of mature bolls is present in restricted areas.

T. L. Bissell (September 17): Very injurious to Sea Island cotton at the station at Experiment, attacking squares and bolls. Three or four adults on a boll.

O. I. Snapp (September 9): Weather conditions during the last 3 weeks at Fort Valley have favored boll weevil development and the insect is abundant, causing considerable damage to the crop.

Mississippi. C. A. Henderson and J. E. Rayland (September 18): In Oktibbeha County practically all squares are now infested, although the crop is about matured.

E. W. Dunnam (September 4): In Washington County the weevil is damaging the late bolls and practically destroying all extremely late cotton. Excessive rains have caused most farmers to stop poisoning. (September 25): It is estimated there are at least one hundred times as many weevils on this date as there were last season.

C. Lyle (September 24): Reported numerous in all sections of the State, injuring most of the squares and some of the young bolls.

Louisiana. R. C. Gaines (September 18): Conditions continue favorable for the multiplication of boll weevils and indications are now that upless leaf worms soon become sufficiently numerous to strip the cotton, a large number will enter hibernation.

Oklahoma. C. F. Stiles (September 18): Generally present throughout the east side of the State and is destroying all of the late crop in Choctaw and McCurtain Counties.

Texas. K. F. Ewing and R. L. McGarr (September 18): Increasing in all fields where squares or young bolls are present. Some of the old cotton has taken on new growth and is supplying abundant food for the weevils.

PINK BOLLWORM (Pectinophora gossypiella Saund.)

Texas. A. J. Chapman and H. S. Cavitt (September 18): Records of infestation and crop conditions made during 1936 and 1937 in 30 identical fields in the Big Bend area of Texas show a higher and earlier infestation this year than last. During the latter part of August 1937 an average of 73 percent of the green bolls were infested, with an estimated larval population of 212,000 per acre, as compared with 37-percent boll infestation and 65,000 larvae per acre in 1936. During the week ended September 18, 1937, in the 19 fields examined the average percentage of green bolls infested increased to 97 percent, with 8.8 larvae per infested boll, in comparison with 90-percent boll infestation and 5.9 larvae per boll last year. However, the crop was also much further advanced and was maturing considerably earlier than last year, as shown by an average of 2.6 green bolls per plant in 1937 and 5.9 green bolls per plant in 1936, and the damage is not expected to be any greater than last year, despite the high infestation. (September 25): A total of 1,497 bales had been ginned up to September 24, as compared with 601 bales on the same date last year. Infestation counts made in 11 fields during the week showed 100-percent infestation of green bolls, with an average of 13.9 larvae per boll and 2.3 bolls per plant. Last year the same fields averaged 91-percent infestation at this date with 5.97 larvae per boll and 5.2 green bolls per plant.

COTTON LEAF WORM (Alabama argillacea Hbn.)

Georgia. W. L. Lowry (August 28): In Lowndes and Echols Counties, in southern Georgia, several specimens have been picked up recently but there is no general infestation.

P. M. Gilner (August 30): A few have been noted in Lowndes and Cook Counties, but in Tift County none has been taken to date.

T. L. Bissell (September 16): Five moths were caught in a light trap on September 12, 13, and 14 at Experiment, the first individuals seen this year.

Tennessee. G. M. Bentley (September 24): In making inspection of our cotton fields in western Tennessee the week beginning September 20, no cotton leaf worms were found, and from county agents in the Cotton Belt we learned that no reports have been filed. The few leaf worms that occurred near Covington, in Tipton County, came very late, the first seen in September, and caused practically no damage.

Alabama. J. M. Robinson (September 19): The cotton leaf worm is rather generally distributed over the State. It has ragged cotton in the central part of the State and may cause some damage to cotton in the northern part.

Mississippi. J. E. Randall (September 13): In Oktibbeha County cotton leaf worms are quite numerous in one field but only a few were noted in other fields.

E. W. Dunnam (September 11): A few leaf worms occurring in some fields.

The first moth observed this season was taken in the Leland Post Office on September 4. (September 25): Can be found in a few fields but is making little progress.

C. Lyle (September 24): Damage has been reported from all sections of the State. Much cotton in the southern part of the State has been defoliated but not much damage is expected in the northern part.

Louisiana. R. C. Guines (September 18): In Madison Parish, in the Delta section, leaf worms have not increased greatly during the last week. A few scattered fields have been stripped and a few more have been "ragged." (September 25): Leaf worms have not materially increased during the last week.

C. O. Eddy (September): Infestations have been widespread but more scattered than usual.

Oklahoma. C. F. Stiles (September 18): Present over most of the cotton-growing areas of Oklahoma. Comparatively few of the fields have been defoliated.

Texas. K. P. Ewing and R. L. McGarr (August 28): In Calhoun County the cotton leaf worm continues to slowly strip the fields of old cotton. Many fields are entirely stripped of all green foliage:

R. W. Moreland and A. B. Beavers (September 25): In Brazos and Burleson Counties leaf worms have completely defoliated a large acreage.

A. J. Chapman (September 11): Leaf worms are stripping the plants in spots in most of the fields near Presidio. The crop is too far advanced for them to do much damage.

BOLLWORM (Heliothis obsoleta F.)

Georgia. W. L. Lowry (August 28): During the last several weeks damage has been conspicuous in Lowndes and Echols Counties.

P. M. Gilmer (August 30): Scattering infestations in most fields in southern and central Georgia, although in fields close to corn heavy infestations are found. Upland cotton is largely past damage.

Mississippi. J. E. Ragland (September 4): In Oktibbeha County bollworms are becoming numerous and are doing some damage to small and medium-sized bolls.

E. W. Dunnam (September 11): A few bollworms have been noted and are doing some damage in rank cotton in Washington County.

Oklahoma. F. A. Fenton (September 20): Unusually abundant, as compared with a year ago. Widespread damage is being caused to cotton bolls and the bollworm is very common in alfalfa, sorghum, and late corn.

Texas. R. W. Moreland (September 18): In Brazos and Burleson Counties the moth population is fairly heavy in plots of young cotton. (September 25): Eggs averaged 4.8 per 100 terminal shoots in the plots examined this week.

K. P. Ewing (August 28): Damage continues serious in Calhoun County in nearly all young cotton, notwithstanding the fact that the cotton is being dusted fairly regularly.

COTTON FLEA HOPPER (Psallus serietus Reut.)

Texas. K. P. Ewing and R. L. McGarr (September 4): Flea hoppers are very abundant on croton in Calhoun County, on the Gulf coast, but there are very few on cotton.

R. W. Moreland (September 25): The flea hopper population is light in the experimental plots at College Station, eastern Texas.

COTTON APHID (Aphis gossypii Glov.)

Texas. K. P. Ewing and R. L. McGarr (September 4): All fields of young cotton in Calhoun County show a very heavy infestation of aphids. (September 11): There has been an apparent let-up in the infestation and damage in young cotton, owing to rainfall.

Mississippi. E. W. Dunnam (September 25): Aphids can be found in small numbers in any field in Washington County but are not abundant enough to be serious.

Georgia. W. L. Lowry (August 28): Only those fields that have received regular treatment show infestation to any noticeable extent in Lowndes and Echols Counties.

Arizona. T. P. Cassidy (August 10): A very heavy infestation was reported on cotton in a 50-acre tract at Eloy and in a few adjoining fields. The terminal buds in these heavily infested areas were simply matted with lice and most all of the plants were covered with honeydew. In fact, the ground under many of the plants was brown from the honeydew that had dropped from them. Little or no parasitization was found in any of the fields. After a rain, however, the infestation disappeared.

California. C. S. Morley (September 3): Aphids may be found in practically every cotton field in Kern County. In some places the ground is discolored by honeydew; however, such infestations are seldom found.

POTATO LEAFHOPPER (Eproussa fabae Harr.)

Louisiana. H. L. Dozier (August 19): Very abundant on cotton at Sligo.

BEAN THRIPS (Heliothrips fasciatus Perg.)

California. C. S. Morley (September 3): Bean thrips plentiful on cotton in Kern County. In some areas where cotton plants did not receive sufficient water considerable injury occurred. Cotton plants were defoliated in parts of some fields.

FOREST AND SHADE - TREE INSECTS

FALL WEBWORM (Hyphantria cunea Drury)

Maine. H. B. Peirson (August 31): At Gardiner, near Augusta, the nests are very abundant on willows and elms.

Massachusetts. A. I. Bourne (September 20): The fall webworm has been scarce.

Rhode Island. A. E. Stene (September 21): Abundant in some parts of the State.

Maryland. E. N. Cory (September): General infestation of the fall webworm.

Georgia. O. I. Snapp (September 9): Weather conditions during the last 3 weeks have favored the fall webworm, which is unusually abundant at Fort Valley, central Georgia, and has caused considerable defoliation of pecan trees.

Ohio. T. H. Parks (September): More abundant than usual in shade trees and on fruit trees that did not receive after-bloom sprays.

N. F. Howard (September 20): Numerous in central Ohio but the colonies apparently have not thrived as well as they sometimes do. Although webs are present on a great many trees, they are not as large as usual.

Indiana. J. J. Davis (September 25): H. textor Harr. was reported abundant in elm, willow, and other trees in the southern part of the State early in September.

Illinois. C. L. Metcalf (September 21): Unusually abundant on elms and other shade trees.

Tennessee. G. M. Bentley (September 25): Comparatively little injury has occurred in the State. Heavy infestation usually occurs every second year.

Alabama. J. M. Robinson (September 19): Moderately abundant on pecans.

Mississippi. C. Lyle (September 24): Has been reported fairly abundant in the Jackson and Durant districts.

WHITE-MARKED TUSSOCK MOTH (Hemerocampa leucostigma S. & A.)

Ohio. E. W. Mendonhall (September 4): Quite bad on elms in certain parts of Columbus.

Indiana. J. J. Davis (September 25): Defoliated maple trees at Frankfort the last of August.

DOUGLAS FIR TUSSOCK MOTH (Hemerocampa pseudotsuga McD.)

Michigan. R. Hutson (September 20): Denuded evergreens at Dunbar.

A BAGWORM (Oiketicus townsendi Ckll.)

Arizona. C. D. Lebert (September 2): Several large ashes, elms, and poplars were defoliated in the Safford area.

A CATERPILLAR (Melipotis acontioides Guen.)

Puerto Rico. G. N. Wolcott (September 13): An extensive outbreak of this caterpillar was observed on the trees lining the road between Santa Rita and Guanica last week. The last outbreak of this caterpillar was in the Hato Rey and the Santruce-Condado section of San Juan (a different part of the island) in August 1933.

CARROT BEETLE (Ligyrus gibbosus Deg.)

North Carolina. E. G. Brewer (September 21): A nurseryman at Reynolds sent specimens of the carrot beetle stating that these beetles were causing considerable damage in his nursery by girdling the roots of various plants.

ALDER

A SAWFLY (Hemichroa pacifica Rohw.)

Washington. M. H. Hatch (September 22): Very great abundance. Alders stripped in August on Vashon Island, King County, and between Gig Harbor, Pierce County, and Bremerton, Kitsap County.

WESTERN TENT CATERPILLAR (Malacosoma pluvialis Dyar)

Washington. (September 22): A moderate number of nests of this species observed along the roadsides in central King County. The species has not been abundant in this locality since 1931. Moderate abundance on alder.

BEECH

BEECH SCALE (Cryptococcus fagi Baer.)

Maine. H. B. Feirson (September 14): Very heavy infestation in eastern Washington County and increasing in intensity.

OYSTERSHELL SCALE (Lepidosaphes ulmi L.)

New Hampshire. R. C. Brown (September 1): Abundant on many large woodland beech trees for at least 20 miles along the highways in Dublin. The foliage on the tips of many branches has turned brown.

BIRCH

BRONZED BIRCH BORER (Agilus anxius Gory)

Wisconsin. E. L. Chambers (September 22): Throughout the State birch trees

exposed to the sun in home plantings continue to become infested almost the first summer after being planted and the borer is becoming prevalent in forest stands where the other trees have been taken out and the woods opened up.

BIRCH LEAF-MINING SAWFLY (Phyllotoma nemorata Fall.)

Maine. H. B. Pearson (September 14): On August 20, the infestation in the Dead River district, western Maine, was estimated to be mining 60 percent of the foliage and was very heavy. Trees appear brown over large areas at Bar Harbor and in the vicinity of Augusta.

CATALPA

CATALPA SPHINX (Ceratomia catalpae Bdv.)

Virginia. G. E. Matheny (September 9): Many catalpas practically defoliated by large caterpillars during summer and early fall.

Ohio. J. S. Houser (September): Many specimens of trees and smaller plantings along highways were observed late in the summer to be practically defoliated. One large plantation near Mechanicsburg, in west central Ohio, containing 125 acres of trees, some of which are 35 feet high, is reported to have been stripped of foliage during the last 4 weeks.

Indiana. J. J. Davis (September 25): Has been fairly abundant in all parts of the State. During September the common parasite Apanteles congregatus Say was unusually abundant at Lafayette, a large majority of the larvae being attacked.

ELM

MOURNING-CLOAK BUTTERFLY (Nymphalis antiopa L.)

Indiana. J. J. Davis (September 25): Was unusually abundant in a few localities in the northern end of the State early in September.

EUROPEAN ELM SCALE (Gossyparia spuria M. d.)

Wisconsin. E. L. Chambers (September 20): The European elm scale, which was pretty well wiped out by the intense heat of the summer of 1936, began showing up by midsummer in several of the larger cities in southern Wisconsin.

FIR

AN APHID (Drayfusia picene Ratz.)

Vermont. H. J. MacAloney (September 23): In various localities in New Hampshire and Vermont the fir bark louse is increasing. Recently dead trees were beginning to become evident late in August and early in September.

Oregon. F. P. Keen (September 21): Some white fir twigs showing galls near Salem were determined by P. W. Mason as D. piceae.

LARCH

LARCH SAWFLY (Lygaeonematus erichsonii Htg.)

General. G. E. Orr (September): Present in smaller numbers than has been observed for at least 15 years in most tamarack stands in the Lake States. This is largely because of the extreme heat and drought early in July 1936. Young sawfly larvae were abundant early in the summer of 1936, but nearly all of them died before reaching maturity. In some areas it has been almost impossible to find larvae in 1937, although reports of some defoliation in parts of upper Michigan have been received.

West Virginia. W. L. Maule (August 27): Specimens of pupal cases were taken in connection with infestation of European larch on the Rothlufal Plantation, Monongahela National Forest. (Det. by R. A. Cushman.)

LOCUST

LOCUST LEAF MINER (Chalepus dorsalis Thunb.)

Rhode Island. A. E. Stone (September 21): Abundant near Westerly and locust groves were defoliated by the end of August.

Virginia. H. E. Hamric (August 17): They were found swarming over the locusts in Independence, Grayson County, and eating chlorophyll from the leaves to such an extent that the leaves were drying up, giving the leaves the appearance of having been bitten by a heavy frost. The locusts were attacked last year, but not to a harmful extent. This year they look as though they will die. (Det. by H. S. Barber.)

North Carolina. Z. P. Metcalf (September 18): I have never seen this insect more widespread or more injurious than it has been this year in the northwestern part of the State. In large areas every leaf of every tree is completely riddled. There are occasional areas where the damage is not so extensive and a few isolated trees are not damaged.

MAPLE

GREEN-STRIPED MAPLE WORM (Anisota rubicunda F.)

Virginia. A. M. Woodside (September 20): Several young silver maples near Staunton have been defoliated for the third successive year.

A GALL INSECT (Eucynura communis Felt)

New Hampshire. E. P. Felt (September 22): Red maple leaves with the veins almost entirely deformed by the maple gouty gall were received from Nashua, the infestation being extremely severe.

OAK

ORANGE-STRIPED OAK WORM (Anisota senatoria S. & A.)

Indiana. J. J. Davis (September 25): Abundant in August, defoliating oaks, particularly pin oaks, in Starke County, in the northern part of the State.

Michigan. R. Hutson (September 20): Has been abundant at Dunbar.

WALKINGSTICKS (Phasmidae)

Pennsylvania. F. W. Graham (September 10): Twelve to fifteen noticed on small growth of chestnut oak in Polk Township, Monroe County. Infestation heavy. Considerable feeding noted on large growth.

PINE

EUROPEAN PINE SHOOT MOTH (Rhyacionia buoliana Schiff.)

Michigan. R. Hutson (September 20): Shows numerous infestations in Lakeland, Livingston County, and in Wayne and Monroe Counties.

NANTUCKET PINE SHOOT MOTH (Rhyacionia frustrana Comst.)

Mississippi. C. Lyle (September 24): Larvae of this species were reported injuring young pine at Lyon on September 1.

IMPERIAL MOTH (Eacles imperialis Drury)

Rhode Island. A. E. Stone (September 21): Caterpillars were sent in from Kent County with the complaint that they were defoliating white pine.

SEQUOIA PITCH MOTH (Vespa mima sequoiae Hy. Edw.)

Washington. J. C. Evenden (September 1): Seriously injuring mature ponderosa pine at Spokane.

LODGEPOLE PINE NEEDLEMINER (Recurvaria milleri Busck)

California. G. R. Struble (September): A flight started on July 10 and subsided on August 15, with the peak occurring between July 25 and August 10. The heaviest centers of infestation are found within the Tuolumne watershed of the Yosemite National Park.

BLACK TURPENTINE BEETLE (Dendroctonus terebrans Oliv.)

Alabama. J. M. Robinson (September 19): Loblolly and longleaf pine were reported as being seriously attacked at Clanton.

Mississippi. J. Milton (September 24): Specimens were collected on pine at Jackson on September 17.

PINE NEEDLE SCALE (Chionaspis pinifoliae Fitch)

Utah. G. F. Knowlton (September 15): Pine needle scale is damaging ornamental Austrian pine, as well as some other pines and spruce, on the College campus at Logan.

POPLAR

POPLAR TENTMAKER (Ichthyura inclusa Hbn.)

Virginia. C. R. Willey (September 17): On a trip from Winchester, in the Shenandoah Valley, I noticed that practically all of the poplars along the way were defoliated.

Ohio. E. W. Mendenhall (September 4): The poplar tentmakers are quite bad in some of the poplars in Columbus and vicinity.

Kentucky. W. A. Price (September 24): Present in large numbers on poplar and willow trees at Walton.

SPRUCE

SPRUCE BUDWORM (Cacoecia fumiferana Clem.)

Massachusetts and Vermont. L. H. Noble (September 7): Heavy feeding on spruce and fir at Greenfield. Center of infestation appears to be about 2 miles north of the Wilmington, Vt., post office.

EUROPEAN SPRUCE SAWFLY (Diprion polytomum Htg.)

Maine. H. B. Peirson (September 14): The insect has increased at an alarming rate over last year and is now present all over the State wherever spruce occurs. Defoliation is noticeable and some trees have died in areas in Aroostook, northern Somerset, and northern Piscataquis Counties, on the watersheds of the St. John and Allagash Rivers. From all collections made at parasite liberation points of 1936, the parasite Microgaster fuscipennis Zett. has been recovered from cocoons collected at Presque Isle, Masardis, Bar Harbor, and in Township 12, Range 16.

New Hampshire. H. J. MacAloney (September 23): Approximately 1,250 acres of spruce on the north slope of Mount Monadnock is nearly defoliated and there is a medium-to-heavy infestation in 2,500 acres surrounding this area. Several smaller areas of heavy infestation were found in this general region.

Vermont. H. L. Bailey (September 27): Reported extremely abundant at Wilmington, south-central Vermont, and at Lincoln, central Vermont, both in Windham County.

F. A. Dailey (September 1): Complete defoliation observed in several solid stands of spruce at Wilmington. Isolated trees show 70 to 90 percent defoliation.

EASTERN SPRUCE BEETLE (Dendroctonus piceaperda Hopk.)

Vermont. J. V. Schaffner, Jr. (September 15): The outbreak reported last year in the Green Mountain National Forest still persists. Surveys conducted by the Forest Service show that newly infested trees are scattered throughout many areas of mature spruce. Control work is being carried on in areas where there are concentrations of infested trees.

ENGELMANN SPRUCE BEETLE (Dendroctonus engelmanni Hopk.)

Wyoming. J. C. Evenden (September 1): Heavy loss of Engelmann spruce throughout the northwest corner of Yellowstone National Park.

WILLOW

IMPORTED WILLOW LEAF BEETLE (Plagioderia versicolora Laich.)

Maine. H. B. Peirson (September 1): Willows severely skeletonized and in general badly browned in areas in the vicinity of Ogunquit, York County (southern tip of State). Adults present.

Rhode Island. A. E. Stone (September 21): The imported willow leaf beetle has been unusually abundant and willows in many parts of the State have been defoliated.

A GALL INSECT (Rhabdophaga batatus Walsh)

Connecticut. E. P. Felt (September 22): Has been somewhat abundant and injurious on pussy willow at New Canaan.

I N S E C T S A F F E C T I N G G R E E N H O U S E

A N D O R N A M E N T A L P L A N T S

CHINESE MANTIS (Tenodera sinensis Sauss.)

Rhode Island. A. E. Stone (September 21): A Chinese mantis has been sent in from Narragansett. About 2 years ago we had a report which I think was the first.

Connecticut. W. E. Britton (September 21): Several adults have been brought to the station from New Haven, Orange, and West Haven, and reports indicate that the insect is common in Bridgeport and Norwalk.

BLACK BLISTER BEETLE (Epicauta pennsylvanica Deg.)

Maryland. F. F. Smith (September 20): Severely damaged China-asters in experimental plots at Beltsville. Softer inner parts of buds were eaten out as soon as bracts separated sufficiently for beetles to gain access to them.

Wisconsin. E. L. Chambers (September 20): Were unusually abundant during the latter part of August and the first part of September doing serious injury to garden flowers and vegetables.

A SCARABAEID (Ochrosidia villosa Burm.)

Connecticut. W. E. Britton (September 21): About 3 acres of lawn on a small estate in East Norwalk were badly damaged by grubs.

SOD WEBWORMS (Crambus spp.)

Florida. J. R. Watson (September 22): The grass webworm is responsible for considerable damage to grass, meadows, and lawns. It is not usual for this pest to be numerous at this time of the year. It is usually a spring pest.

Iowa. H. E. Jaques (September 24): Crambid moths are very abundant in flight.

HAIRY CHINCH BUG (Blissus hirtus Montd.)

Rhode Island. A. E. Stone (September 21): A large lawn in Providence was destroyed about the middle of August. Some previous trouble with the lawn had been experienced, but the owner did not report the situation until destruction was complete.

Connecticut. W. E. Britton (September 23): Several instances of severe damage to bentgrass lawns in New Haven have come to our attention during the last month.

Ohio. J. S. Houser (September 15): Several instances of damage to lawn grass have been reported from the Cleveland area. The greatest damage occurred late in August and early in September.

A PLANT BUG (Corizus sidae F.)

Georgia. T. L. Bissell (September 15): Bug abundant and injurious on althea at Experiment, central Georgia.

GARDEN FLEA HOPPER (Mallicolus citri Ashm.)

Maryland. F. F. Smith (September 20): Abundant at Beltsville where white clover in lawns, asters, and chrysanthemums are being attacked. At Silver Spring adults and nymphs are numerous and are causing conspicuous injury on ageratum, dahlia, yarrow, salvia, crimson clover, white clover, turnip, beet, and melon. No injury observed at Silver Spring in 1936.

Mississippi. C. Lyle (September 24): The garden flea hopper was injuring violets at Jackson on September 17 and verbenas at Starkville on September 22.

A MIRID (Plagiognathus nolitatus Uhl.)

Illinois. C. L. Metcalf (September 21): Was very abundant late in August and early in September in gardens in central Illinois, attacking Funkia, zinnia, dahlia, aster, and other flowers.

TWO-MARKED TREEHOPPER (Enchenopa binotata Say)

New York. R. L. Horsey (September): On September 20 a number of egg masses were found on Viturnum rufidulum and a few on V. carlesi in Rochester.

A WHITEFLY (Dialeurodes sp.)

North Carolina. Z. P. Metcalf (September 18): About the usual number of complaints. Damage moderate to privet hedge in the eastern part of the State.

Georgia. O. I. Shapp (September 9): Whiteflies are unusually abundant, and have caused considerable damage to shrubbery in the yards at Fort Valley, central Georgia.

Mississippi. C. Lyle (September 24): Specimens of the citrus whitefly were collected on privet at Columbia on September 5. It was reported present on ornamentals in the Meridian and Brookhaven territories and on satsuma at Moss Point.

COTONEASTER

LEAF CRUMPLER (Mineola indigenella Zell.)

Nebraska. M. H. Swenk (September 22): The leaf crumpler was reported attacking cotoneaster plants in Sheridan County on September 6.

DAHLIA

A TREEHOPPER (Entylia sinuata F.)

Louisiana. H. L. Dozier (September 16): Small treehopper becoming more abundant, breeding on the underside of dahlia foliage at Opelousas.

EUONYMUS

EUONYMUS SCALE (Chionaspis euonymi Comst.)

District of Columbia. E. H. Cory (September 24): Noted on euonymus in Washington, D. C.

North Carolina. Z. P. Metcalf (September 18): Damage severe to euonymus over the whole State.

FERN

AN APHID (Idiopterus nephrolepidis Davis)

New Jersey. M. D. Leonard (May 2): At Ridgewood the new shoots, especially of a large potted plant of Boston fern in the house, are infested with a great many of this rather rare aphid.

GLADIOLUS

GLADIOLUS THRIPS (Taeniothrips simplex Horison)

Connecticut. W. E. Britton (September 21): The gladiolus thrips seems to be less troublesome generally than for several years. Specimens have been received from Lakeville and Woodbridge.

Wisconsin. E. L. Chambers (September 20): Has been very serious to untreated plantings throughout the State, and many commercial growers who were careless about the treatment, or where there were untreated plantings nearby, suffered serious losses.

HAWTHORN

WOOLLY APPLE APHID (Eriosoma lanigerum Hausm.)

New York. R. E. Horsey (September): Some infestation on several hawthorns but only one tree found badly infested causing defoliation on September 20 at Rochester. This aphid was formerly a severe pest, appearing in numbers in August.

. PEAR SLUG (Eriocampoides limacina Retz.)

New York. R. E. Horsey (September): Considerable damage to the leaves of the Dunbar hawthorn, with a large number feeding on August 24. Two trees of black hawthorn and one tree of Japanese Flowering Cherry were found with almost all the leaves badly eaten. The last live slugs were found on September 8 at Rochester.

LILAC

LILAC BORER (Podsesesia syringae Harr.)

New York. R. E. Horsey (September): Very numerous and destructive in lilacs during September at Rochester.

RHODODENDRON

RHODODENDRON LACEBUG (Stephanitis rhododendri Hort.)

Connecticut. W. E. Britton (September 21): Rhododendron and mountain laurel plants in nurseries have been commonly infested and specimens on rhododendron have been received from Bantam, New Britain, New London, Westport, and Woodbridge.

INSECTS ATTACKING MAN AND
DOMESTIC ANIMALS

MAN

MOSQUITOES (Culicinae)

New Jersey and New York. W. Hande (September 22): The common swamp mosquito (Aedes vexans Meig.) and the salt-marsh mosquito (A. sollicitans Walk.) were not particularly severe this last season in New Jersey and on Long Island, N. Y., at least not up to the early part of September.

New Jersey and Maryland. W. Hande (September 22): The northern house mosquito (Culex pipiens L.) was abundant and annoying late in August and early in September at isolated points in New Jersey and Maryland.

Virginia. H. G. Walker (September 25): Mosquitoes were very abundant in many places on the Eastern Shore of Virginia during the early and middle parts of July. It was reported that they were killing wild ponies and other animals on Chincoteague Island.

Georgia. T. L. Bissell (September 8): Mosquitoes, Culex spp., have been very troublesome in houses at Experiment for 2 weeks.

EYE GNATS (Hippelates spp.)

Maryland. E. C. Cushing (September 27): In Silver Spring eye gnats were troublesome during the early part of the month.

CAT AND DOG FLEAS (Ctenocephalides spp.)

Maine. H. B. Peirson (August 20): C. felis Bouche and C. canis Curt. are reported from Augusta as being very abundant in houses and lawns.

Rhode Island. A. E. Stone (September 21): A larger number of complaints than usual have come in from returning vacationists regarding the abundance of fleas encountered when they returned to their homes.

New York. R. W. Leiby (September 7): The cat flea has overrun the State during the last 6 weeks, if complaints from correspondents are an indication of its prevalence. Many lots identified by R. Matheson show that the cat flea is the only offender.

North Carolina. Z. P. Metcalf (September 18): There have been more complaints of fleas than for many years.

Indiana. J. J. Davis (September 25): The cat and dog fleas are more abundant in farm buildings and homes in all parts of Indiana than we have ever before observed. Most of the reports came to us the last of August and in September.

Illinois. W. P. Flint (September 20): Numerous reports of flea infestations, both in towns and on farms, have been received during the month.

Michigan. R. Hutson (September 20): Cat and dog fleas have been especially abundant all over the Lower Peninsula.

Nebraska. M. H. Swank (September 22): Reports of infestation of a basement and a house by the dog flea came from Dodge County on August 24 and September 12.

SADDLEBACK CATERPILLAR (Sibine stimulea Clem.).

Maryland. E. C. Cushing (September 10): Several specimens of this species of urticating lepidopteron were collected from a privet hedge in Silver Spring. Each specimen collected was found after it had stung the person who was clipping the shrubbery.

Indiana. J. J. Davis (September 25): Received from several localities in eastern and northern Indiana, where it was commonly found on corn, some observers reporting irritation caused from handling corn infested by the caterpillars. All reports received in the last few days of August.

Connecticut. W. E. Britton (September 21): Larvae have been received as follows: On corn from New Haven, on dahlia from Derby, on rose from Milford, and without food plant from Branford.

Maryland. E. N. Cory (September 24): Noted on poinsettia in Prince Georges and Allegany Counties.

PUSS CATERPILLAR (Megalopyge opercularis S. & A.)

Mississippi. K. L. Cockerham (September 21): One larva was brought to Biloxi, with the statement that a man had been "stung" by the insect. The larva had fallen from an oak tree and the man had brushed against it with his arm. The "sting" was reported as being very painful, but the man did not receive medical attention. On September 11, a larva was brought in by a woman who had been "stung" on the wrist by it. She stated that she experienced severe pains throughout her arm and had received treatment from a physician. On September 18 another specimen was brought in, with the statement that a small child had been "stung", and had been threatened with convulsions. The child was treated by a physician, who informed me that no serious or unusual reactions were noted by him when the child was brought to his office. In both instances the larvae had dropped from pecan trees.

C. Lyle (September 24): Larvae have been received from Sentag, Heidelberg, Booneville, and West Point. It was reported that at each of these places some person had been injured by the sting of this caterpillar.

AMERICAN DOG TICK (Dermacentor variabilis Say)

Massachusetts. C. N. Smith (September 1): Activity of adult ticks at Martha's

Vineyard, practically ceased during the last 2 weeks of August. The latest collection was an engorged female taken from a dog on August 29 and an unattached male from a man on the same date.

A. E. Stene (September 21): Collected on Cape Cod in an effort to determine whether they were carriers of the Rocky Mountain spotted fever, which two people from Providence contracted while vacationing on the cape.

EAR TICK (Ornithodoros megnini Duges)

Nebraska. M. H. Swenk (September 22): The spinose ear tick was infesting the ear of a horse in Sheridan County on September 4.

RABBIT TICK (Haemaphysalis leporis-palustris Pack.)

Nebraska. M. H. Swenk (September 22): Specimens were sent from Douglas County on September 9, with the report that the tick was infesting dogs and had also been found alive in the house.

Correction.--In the Insect Pest Survey Bulletin Vol. 17, September 1, 1937, (no. 7, p. 376), regarding the American dog tick in Connecticut, by P. Garman, the name should read, "Rhipicephalus sanguineus Latr."

BLACK WIDOW SPIDER (Latrodectus mactans F.)

Virginia. H. G. Walker (September 25): Appears to be common in eastern Virginia. Specimens have been taken in flower gardens, in buildings, under boards and stones, and in melon and cornfields.

Georgia. T. L. Bissell (September 8): Several reports have come in showing an abundance of this spider. Recently a man in Spalding County, central Georgia, died of a spider bite. On September 4 a woman at Experiment was bitten. A correspondent at Clarkston reports black widows on the stairs leading to the second floor. I have seldom heard of this spider in houses.

Nebraska. M. H. Swenk (September 22): Reports of the presence of black widow spiders in such places as caves, house basements, around a schoolhouse, and in drainage culverts, came from several counties during the period August 25 to September 18.

Utah. G. F. Knowlton (September 18): A number of reports of black widow spiders found in houses and barns have been received during the season.

CATTLE

SCREWORM (Cochliomyia americana C. & P.)

South Carolina. R. A. Roberts (September 30): Cases estimated in different

counties for the 2-week period ended September 10 were: Beaufort 125, Jasper 125, Colleton 125, Hampton 60, Allendale 35, Charleston 15, Berkeley 10, Dorchester 5, Bamberg 8, Orangeburg 2, and Barnwell none. For the last 2 weeks of September the estimated cases were: Colleton 175, Dorchester 75, Beaufort 22, Hampton 24, Barnwell none, and Aiken none. On September 29 specimens were identified from Sumter.

Georgia. R. A. Roberts (September 30): For the week ended September 2 there was a generalized occurrence of 5,735 estimated cases, principally in the open-range areas, but with small numbers occurring in the farming counties. An outbreak proportion of about 600 cases occurred in Brooks County. For the last 2 weeks of September the infestation of the State was estimated at 8,851 cases. These cases occurred south of a line drawn from Richmond to Webster Counties.

Florida. R. A. Roberts (September 30): For the 5-week period ended September 25, there were 7,707 cases occurring among 822,221 animals. Decreased numbers of infestations are occurring in the southern part of the State, and increased numbers in the northern areas, especially in tick bites of woods hogs and cattle. The most western infestation occurs in Gadsden County, where a localized outbreak now seems to be under control.

Alabama and Louisiana. W. E. Dove (September 30): Questionnaires sent by State cooperators and only negative reports of cases received by them.

Kansas. W. E. Dove (September 30): The following were reported for the month ended September 15: Butler County shipment of 900 ewes received at Augusta where a number of cases are giving trouble, Clark County none this year, Coffey County no cases, Marion County no cases, Woodson County 22, Chase County 43, and Chautauqua County 1,610.

Oklahoma. W. E. Dove (September 30): The following reports were received: Love County 5, Marshall County 1, Bryan County 1, and McClain County none. In Osage County stockmen are continuing to ride the ranges and treat cases.

Texas. W. E. Dove (September 30): In the southern counties of Texas 2,281 cases were reported among 1,222,926 animals for the 5-week period ended September 25. Along the coast localized outbreaks on some ranches exceeded a 2-percent infestation of the animals and were caused principally by attachment of the Gulf coast tick (Amblyomma maculatum Koch). In the sheep- and goat-breeding area cases were rare in the lowlands but are now increasing at higher elevations in pricklypear injuries of the mouth. Stockmen in 17 counties of the eastern portion of the sheep- and goat-breeding area report 1,765 cases among 68,608 animals. In eastern Texas, where cattle are being dipped for eradication of the fever tick Bogophilus annulatus Say, no cases of screwworms are encountered. In northern Texas and in the Panhandle cases are rare and the incidence is unusually low for this season of the year.

New Mexico. W. E. Dove (September 30): In Otero County 50 cases were reported from marks and brands in 1,000 cattle, in Luna County 2 cases occurred

among 510 dehorned calves, in Socorro County there were practically no cases, in Eddy County 125 cases were estimated, in Hidalgo County 6 cases were reported in 450 calves, in Harding County about 15 percent of the brands made early in August became infested late in August and early in September, in Lincoln County practically no cases occurred, and in Dona Ana County 43 cases were reported. Recent rains favor increased numbers of cases.

HORN FLY (Haematobia irritans L.)

Texas. E. C. Cushing (September 27): Reports on September 15, from dairymen and stockowners in Eastland County, indicate extreme annoyance from horn flies, with considerable loss of milk flow and weight of animals, even on good pastures.

E. W. Laake (September 20): The population at Fort Worth is on the increase and the flies are exceedingly bothersome to cattle. One ranch foreman reports that in pastures with growth of tall weeds the cattle remain in these areas all day to escape the flies, feeding only at night. In one herd an average of 4,000 flies were estimated on each animal. The injuries caused by the flies are becoming infested with screwworms.

CATTLE GRUB (Hypoderma sp.)

Arizona. C. C. Deonier (September 27): At Tempe observations of cattle in the Salt River Valley showed that at Mesa a few larvae had already reached the backs of the animals on August 17.

HORSE

STABLEFLY (Stomoxys calcitrans L.)

Missouri. L. Haseman (September 23): Throughout September stableflies have continued to be annoying to livestock in central Missouri and during the third week in September, following several days of cool weather, there seemed to be a marked increase in numbers.

Kansas. H. G. Schroeder (August 22): The following observations on the stable fly outbreaks in south-central Kansas from July 23 to August 22 have been reported: This was the heaviest outbreak of stableflies in this region in 15 years. Horses and cattle in many cases were literally exhausted from fighting the flies. Calves suffered particularly. Open wounds 2 inches across were found at the joints of the legs. Even on the backs of some animals areas were depilated and encrusted, or even raw. Many farmers confined their horses in darkened barns during the day. Work animals were handled with difficulty, notwithstanding partial protection afforded by nets and burlap. Man, too, was subject to their vicious attacks and found them as annoying and persistent as mosquitoes. On several occasions, while operating a tractor in the middle of a field, the writer counted more than two dozen on each trouser leg and found them extremely annoying, when the hands were occupied in making adjust-

ments. The flies were less evident and sometimes entirely inactive during the noon-day heat when the temperature approached or passed 100° F. On several days the shaded side of a stock tank was covered with stableflies at the rate of from 100 to 200 per square foot, no doubt attracted by the cooling effect of the water within the tank. A considerable reduction in abundance occurred during the third week in August. Heavy local rains fell in the area from July 10 to 20, followed by 3 weeks of hot, dry weather. More general rains occurred after August 11.

Utah. G. F. Knowlton (September 13): Stableflies are abundant and annoying to livestock at Logan in northern Utah.

POULTRY

STICKTIGHT FLEA (Echidnophaga gallinacea Westw.)

Oklahoma. F. A. Fenton (September 20): The chicken sticktight flea is reported from several places.

RABBIT

RABBIT BOT (Cuterebra sp.)

North Carolina. Z. P. Metcalf (September 18): Damage severe in Buncombe County. One to three bots per rabbit.

HOUSEHOLD AND STORED-PRODUCTS INSECTS

TERMITES (Reticulitermes sp.)

Ohio. J. S. Hauser (September 15): Damaging rhubarb at Cincinnati. The correspondent reports that the occurrence is common in home gardens and that the damage is somewhat severe.

Mississippi. C. Lyle (September 24): Reports of injury to buildings by termites have come from all sections of the State.

Nebraska. M. H. Swenk (September 22): Complaints of damage by termites were received during the period of August 20 to September 6 from Otoe, Clay, Franklin, and Custer Counties. The report from Custer County indicated that the pest was damaging wool blankets in a basement, and the Clay County correspondent stated that the joists and siding of a house were being attacked.

Oklahoma. F. A. Fenton (September 20): There have been the usual large number of inquiries concerning the termite damage to buildings.

HOUSE CRICKET (Gryllus domesticus L.)

Virginia. C. R. Willey (September 17): This cricket, about the first of August, "swarmed" out of a city dump here in Richmond and almost drove folks who

lived nearby from their homes. They seemed especially fond of stockings and certain other wearing apparel.

Wisconsin. E. L. Chambers (September 20): A serious outbreak of the European house cricket occurred in Kenosha and Milwaukee, where swarms of them migrated from city dumps and waste land into the downtown stores. They did serious damage by eating threadon leather goods, drapes, rugs, etc. The infestation first appeared about the first of September.

FIELD CRICKET (Gryllus assimilis F.)

Nebraska. M. H. Swenk (September 22): Complaints of annoyance from the field cricket in and around houses were received during the latter part of August from Lancaster, Saline, and Jefferson Counties.

Kansas. H. R. Bryson (September 29): A considerable decrease in the number of black crickets has taken place during the week ended September 25.

ARGENTINE ANT (Iridomyrmex humilis Mayr)

Mississippi. C. Lyle (September 24): Specimens of the Argentine ant were received from North Carrollton on August 27 and from Jackson on September 14.

PHARAOH'S ANT (Monomorium pharaonis L.)

Mississippi. C. Lyle (September 24): Specimens of this ant were received from West Point on September 20.

MARITIME EAR WIG (Anisolabis maritima Bonelli)

Rhode Island. A. E. Stone (September 21): The maritime ear wig was sent in from a Washington County shore resort with the complaint that they were over-running a summer cottage "by the million."

Virginia. C. R. Willey (September 17): On August 21 this pest was found damaging plants in a garden here in Richmond. They were present by hundreds. Our first record of its occurrence and damage.

BOXELDER BUG (Lentocoris trivittatus Say)

Iowa. H. E. Jaques (September 24): We have a serious complaint of boxelder bugs invading homes in Linn County. This species seems to be up to its normal abundance at least.

A SPIDER BEETLE (Ptinus tectus Boisdieu)

Washington. M. H. Hatch (September 22): Specimens of this species were reported this summer from a residence in the Laurelhurst district in Seattle.

A WEEVIL (Brachyrhinus sp.)

Rhode Island. A. E. Stone (September 21): A weevil was sent in from East Providence with the complaint that such insects were coming into the house in large numbers.

SOUTHERN PINE SAWYER (Monochamus titillator F.)

Louisiana. A. K. Smith, Jr. (September 9): Specimen collected at Opelousas, infesting fence posts. (Det. by A. G. Boving.)

AN ANCEIID (Xyletinus peltatus Harr.)

Mississippi. C. Lyle (September 24): Complaints of this insect in pine floors were received from Leland on August 28 and from Charleston on September 17. Specimens were received from Liberty on September 2.

Special note.--A native American plant, Salvia reflexa, belonging to the mint family, has become a noxious weed in Australia. It would be of considerable interest if entomologists within the range of this plant in the Great Plains and Rocky Mountain States would report on all insects that have been recorded from this plant.

INSECT PEST SURVEY BULLETIN

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October 23, 1937

LIBERATIONS OF PARASITES OF THE EUROPEAN CORN BORER IN THE UNITED STATES IN 1937

By Charles A. Clark,^{1/} associate entomologist
Division of Cereal and Forage Insect Investigations
United States Department of Agriculture

The 1937 program for colonization of parasites of the European corn borer was conducted essentially as were those of the preceding 3 years. Adult parasites were reared from domestically collected host larvae or from similar material imported from Europe. All adult parasites emerged at the Moorestown, N. J., laboratory and were taken from there directly to the field or were shipped in iced containers by rail to other laboratories for release in adjacent infested regions. A total of 21,470 adults were released during the season, which (see Insect Pest Survey Bull. v. 16, no. 3, Sep., Dec. 20, 1936) brings the grand total of corn borer parasites released in the United States to date to over 5,660,000. A summary of the 1937 releases of the various parasites is given by States, counties, and townships in table 1.

Inareolata punctoria Roman.--Emphasis was again placed on the further distribution of the ichneumonid I. punctoria over the previously uncolonized infested area. A 1937 release of this species was made in Northampton County, Va., where it had been previously released in 1936, as the borer was reported to be rapidly increasing in that locality and it was thought that the parasite did not have a satisfactory chance of establishment in 1936, because of the unusual and severe drought of that year. In all, 16 releases of this larval parasite were made in as many counties located in 7 States. The number of adults released in 1937 was 3,837, bringing the total number to 175,577 released since the beginning of the corn borer parasite work. At the close of the 1937 season this parasite had been released in practically all counties known to have sufficient corn borer infestation to justify such releases. Liberations of this species were made in the eastern area from Chittenden County, in northern Vermont, to and including Northampton County, on the Eastern Shore of Virginia.

^{1/} D. W. Jones, W. G. Bradley, E. W. Beck, E. D. Burgess, and K. D. Artuthnot assisted with the releases of the parasites over the infested area.

Similar releases were made in the western area from Huron County, in the "thumb" district of Michigan, southward to Darke and Miami Counties in Ohio and as far west as Steuben and Allen Counties, Ind. The parasite was also released in the heavily infested counties along the south shores of Lakes Ontario and Erie, in western New York. Map 1 shows all counties in which this parasite was released. During the 1937 season, a total of 1,257 adults of I. punctatoria were shipped to Canada for release there.

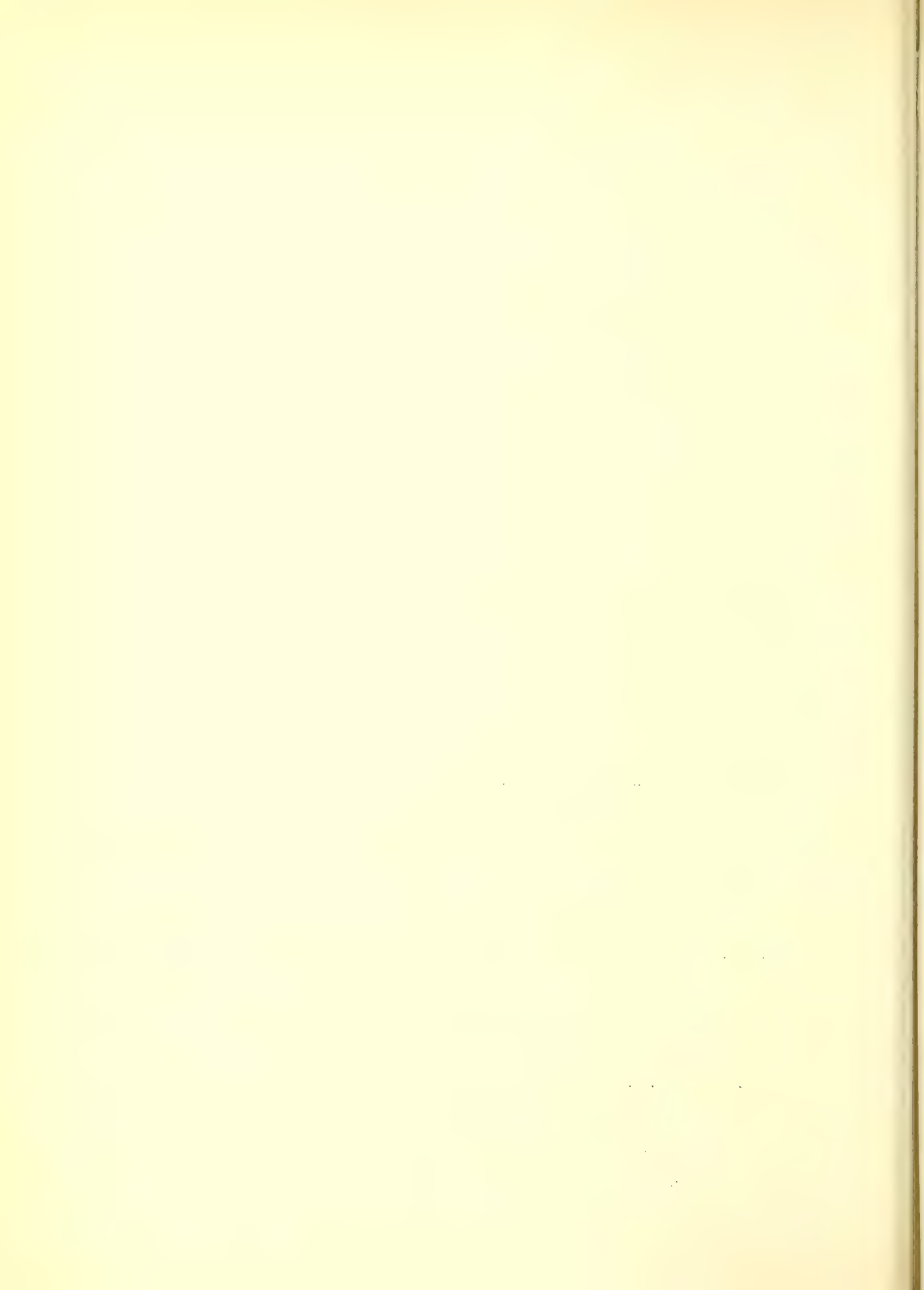
Chelonus annulipes Wesm.--Test releases of the braconid C. annulipes, a parasite which attacks the egg stage of the corn borer and emerges from the fourth-instar larva, were made at two points in Connecticut, one point in New Jersey, and two in Virginia. The releases of C. annulipes in substantial numbers in Virginia were made possible by a supply of this parasite received from the Canadian Department of Agriculture, through the courtesy of the Dominion Parasite Laboratory located at Belleville, Ontario. Adults received from Canada were laboratory reared. The other parasites released emerged from material imported from Italy. Releases in Connecticut and New Jersey were synchronized with the presence in the field of first-generation eggs and in Virginia with eggs of the second generation of the borer. A total of 10,305 adult parasites of this species were liberated at the 5 locations.

Lydella stabulans var. griseescens R. Desv.--This tachinid parasite had been colonized practically throughout the infested area prior to 1937. However, during this season 1 colony, consisting of 1,987 adults, was liberated at New Fairfield, in Fairfield County, Conn., where corn borer infestation had recently increased sufficiently to justify a release. A small release of this parasite was also made in New Jersey. A total of 4,319 adults were shipped to the Dominion Parasite Laboratory at Belleville, Ontario, for release in that area. Over 400 L. griseescens, of which half were mated females, were shipped by air express to the Bureau laboratory at Presidio, Tex., for testing on the pink bollworm (Pectinophora gossypiella Saund.).

Other parasites.--A small number of adults of the larval parasite Bassus agilis Cress. and of labrotychus prismaticus Nort., which emerge from the host in the pupal stage, were obtained. These native parasites were released in New Jersey, as shown in table 1.

Table 1.--Libraries of parasites of the European corn borer in the United States in 1937

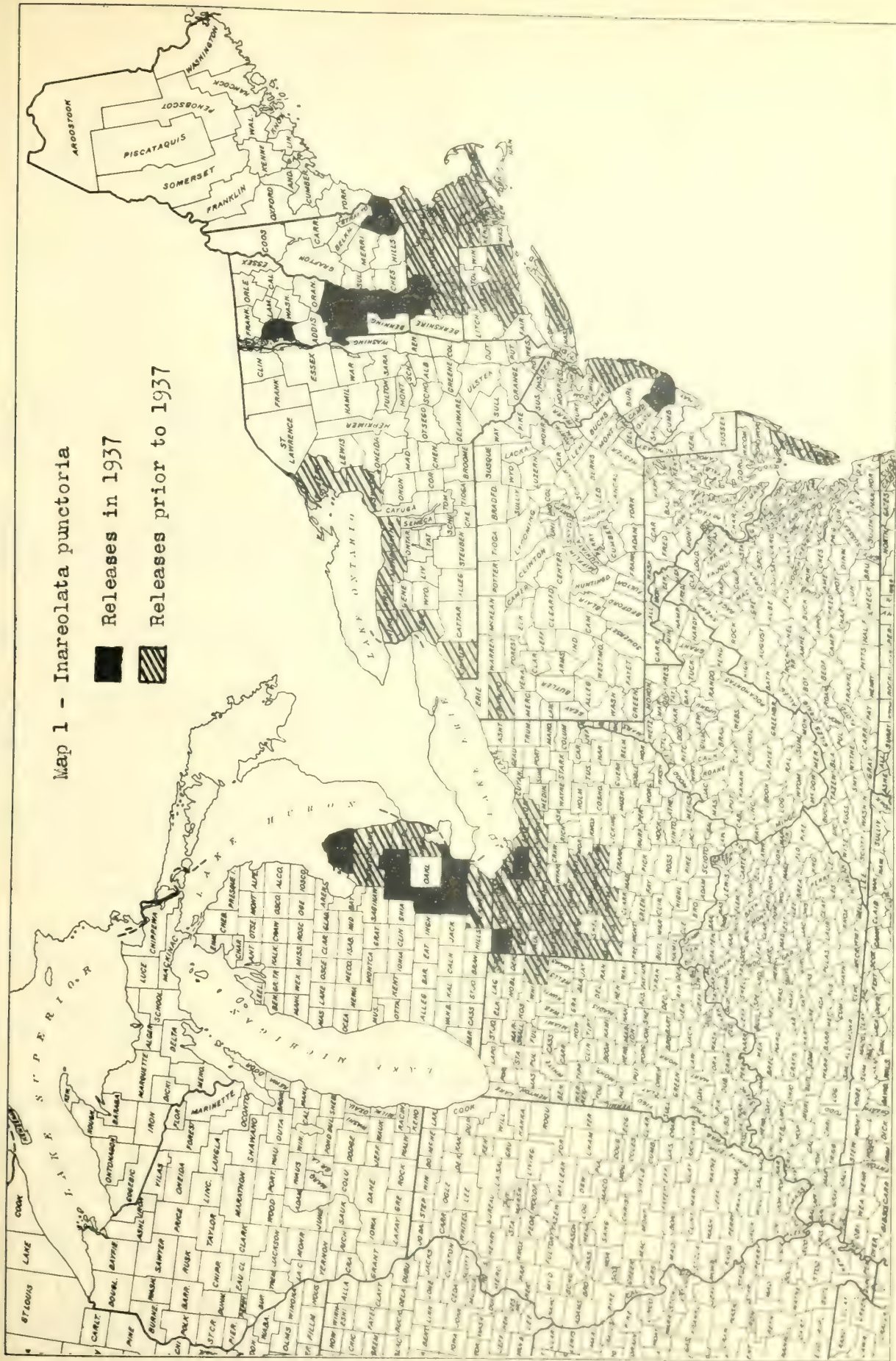
State	County	Township	Parasite societies released					Total
			Inareolata:	Loecella	Clelams:	Barys:	acronyms:	
			parictoria:	griseocens:	annulipes:	allis:	griseaticus:	
Connecticut...	Fairfield	New Fairfield	---	1,927	---	---	---	1,927
Do.....	Hartford	E. Hartford	---	---	593	---	---	593
Do.....	New Haven	Milford	---	---	593	---	---	593
Massachusetts...	Framlingham	Barnstable	575	---	---	---	---	575
Michigan.....	Genesee	Genesee	597	---	---	---	---	597
Do.....	Muskegon	S. Muskegon	598	---	---	---	---	598
Do.....	Lapeer	Goiland	599	---	---	---	---	599
Do.....	Livingston	Concord	600	---	---	---	---	600
Do.....	Washtenaw	Agusta	601	---	---	---	---	601
Do.....	Wayne	Wayne	602	---	---	---	---	602
New Hampshire...	Rockingham	Raymond	603	---	---	---	---	603
New Jersey....	Atlantic	E. Hartford	604	---	---	---	---	604
Do.....	Hurlington	Rockland	---	605	---	---	---	605
Do.....	Monmouth	Atlantic	---	---	---	---	---	---
Ohio.....	Samuelson	Ballville	674	---	---	---	---	674
Do.....	William	Madison	675	---	---	---	---	675
Vermont.....	Crittenden	Box	676	---	---	---	---	676
Do.....	Rockland	Foulness	677	---	---	---	---	677
Do.....	Windsor	Madison	678	---	---	---	---	678
Do.....	Windsor	Windsor	679	---	---	---	---	679
Virginia.....	Accomac	Low	---	---	---	---	---	---
Do.....	Northampton	Northampton	---	---	---	---	---	---
Total.....	---	---	8,257	2,257	10,308	20	61	21,770



Map 1 - Inareolata punctoria

Releases in 1937

Releases prior to 1937





INSECT PEST SURVEY BULLETIN

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November 1, 1937

No. 9

THE MORE IMPORTANT RECORDS FOR OCTOBER

Grasshopper egg surveys have been started in most of the States concerned in the great outbreak of the past summer. Eggs are being found in the anticipated abundance. Egg laying has been somewhat delayed and continues in the southern part of the territory.

An egg survey of the Mormon cricket in Nevada has been completed. Eggs are very abundant in the north, diminishing in numbers southward. A report from Montana indicates that the insect has spread from focal areas scattered over much of the State.

The hessian fly was reported as occurring in some early seeded wheat in Missouri and in southeastern Kansas.

Owing to dry, warm weather favorable to chinch bug development, the insect built up populations rapidly and has entered hibernation quarters in great abundance in Illinois and Kansas.

The velvetbean caterpillar is abundant and destructive in Florida. It was also reported from Louisiana.

The apple maggot showed up in unexpected abundance in an orchard in central West Virginia where it was reported 10 years ago.

The grape berry moth was reported in unusual abundance along Lake Erie in Ohio and in southwestern Michigan.

Infestations of the walnut husk fly have been found in Orange County, Calif., extending the infested territory somewhat to the west.

The California red scale is causing serious injury to citrus in the southern tip of Texas. The scale was also reported in great abundance from Los Angeles County, Calif.

The vegetable weevil is coming out of aestivation and attacking truck crops in the Gulf States.

The northern mole cricket was reported to be very abundant in Massachu-

setts, where it severely damaged potato tubers. This damage seems to be a little extraordinary so far north.

Reports from Minnesota and Iowa indicate that the squash bug is more abundant than usual this fall.

Injury to the immature pods of peanuts by larvae of the spotted cucumber beetle in Virginia was reported in September.

The tobacco worm continued its depredations into late fall, serious injury being reported from Connecticut.

Late season conditions have been very favorable for boll weevil development and reports from South Carolina, Georgia, Florida, Mississippi, Louisiana, and eastern Texas indicate that weevils are much more abundant in the fields than for the past several years. Abundant rains have produced a late growth of squares and young bolls in which the weevils have continued to develop.

GENERAL FEEDERS

GRASSHOPPERS (Acrididae)

- Illinois. W. P. Flint (October 21): We have started the egg survey, and indications are that eggs are much less abundant than they were in the fall of 1936. So little territory has been covered that no accurate statement as to the number of eggs can be made. Nearly all adult grasshoppers have been killed by the heavy rains and low temperatures. In most sections the number of adults was much less than in the fall of 1936.
- Michigan. R. Hutson (October 22): The fall survey discloses an unusual abundance of eggs wherever hoppers were numerous during the summer. The infestation is spotty, some areas carrying normal populations and many small areas and a few large ones carrying heavy populations. Melanoplus femur-rubrum Deg. occurs throughout southern half of the Lower Peninsula in fence rows, ditchbanks, and similar locations. North of the Muskegon-Bay City line M. mexicanus Sauss. and Ageneotettix deorum Scudd. are the predominating species on sandy soils in heavy infestations. M. mexicanus is still the predominant species in northern counties of the Lower and Upper Peninsulas. Camnula pellucida Scudd. staged a strong comeback from last year and the eggs of this species are readily found in all areas where it occurs in more than normal numbers, especially numerous in the vicinity of Perkins, Watson, and Trenary.
- Minnesota. A. G. Ruggles (October 18): The egg survey is on in full force. Eggs of M. femur-rubrum are abundant in some of the southern counties.
- Missouri. L. Haseman (October 22): In central Missouri our first killing frost came on October 10 to 12. Since the first frost in central Missouri there has been no further appreciable frost. This being the case, grasshoppers, particularly M. differentialis Thos., and the less migratory (M. mexicanus), are still laying eggs on warm days. Locally, most of the M. differentialis have now deposited their eggs and are gone, but considerable numbers of M. mexicanus are present and the females contain mature eggs. In places in central Missouri we are finding more eggs of M. differentialis than we have ever seen in past years and far more than there were a year ago.
- Nebraska. M. H. Swenk (October 20): Grasshoppers were largely engaged in oviposition during the period September 20 to October 20. M. differentialis and M. bivittatus Say laid their eggs at the normal time in September, but the ovipositing of M. mexicanus was somewhat delayed. The total egg deposition for all injurious species bids fair to equal or exceed that of the fall of 1936.
- Oklahoma. C. F. Stiles (October 22): Grasshoppers have done considerable damage to the fall-sown wheat and the fall seedings of alfalfa throughout the central and western parts of Oklahoma. The species most common

are M. differentialis and M. mexicanus. Practically all of the M. bivittatus have disappeared. There is also quite a mixture of various species scattered throughout the State. M. mexicanus is, no doubt, the most numerous, and apparently we have had a second generation in some parts of the State. Much poisoning has been done during the last 3 weeks.

Colorado. C. R. Jones (October 21): From the present egg survey, it appears that we will be visited by a tremendous outbreak of hoppers next year and the migratory form, Dissosteira longipennis Thos., will appear in counties not previously infested.

Nevada. G. G. Schweis (October 20): A grasshopper egg survey was completed during the month of September and reveals that over most of the area a normal population of hoppers will occur next year, with indications in a few restricted districts that the populations will be heavy enough to cause severe damage.

Utah. G. F. Knowlton (October 9): Grasshoppers are still abundant and damaging alfalfa and other crops at Liberty, Eden, and Huntsville, in Weber County. Egg laying is well along in most parts of northern Utah, and grasshoppers are decreasingly abundant. (October 12): They appear to be more abundant in Cache, Carbon, Daggett, Davis, Duchesne, Grand, Morgan, Uintah, and Weber Counties than in 1936. Populations were somewhat lower in Utah County, in general.

MORMON CRICKET (Anabrus simplex Held.)

Montana. H. B. Mills (October 21): Although generally kept out of cultivated fields last summer, with injury reduced to a minimum, the area infested increased nearly 60 percent over last year, with the focal areas on the southeastern State line from Carbon to Powder River Counties, in the vicinity of the Highwood Mountains, the Little Rockies and the Bearpaw Mountains, and the area in western Lake and eastern Sanders Counties. They have been reported from most mountainous sections of the State in some numbers and probably every county contains these insects.

Nevada. G. G. Schweis (October 20): An egg survey was completed recently and a heavy deposition of eggs was found in Elko, Humboldt, Eureka, and Lander Counties, with a lesser number in White Pine, Pershing, and Washoe Counties. All indications point to a heavy infestation of these insects in the first-named counties.

FULLER'S ROSE BEETLE (Pentomorus godmani Crotch)

Georgia. C. H. Alden (October 18): Hundreds of these beetles have been found in the last few weeks at Cornelia, feeding on peach foliage. They are more numerous than they have been in years in this section.

O. I. Snapp (October 21): This insect is abundant as usual at Fort Valley, central Georgia, feeding on the foliage of peach trees.

Alabama. J. M. Robinson (October 20): Fuller's rose beetle is very abundant over the State and was reported as ragging shrubbery foliage at Kinston on October 8.

JAPANESE BEETLE (Popillia japonica Newm.)

Virginia. H. G. Walker and L. D. Anderson (October 26): The Japanese beetle appears to be on the increase at the Virginia Truck Experiment Station near Norfolk. Two beetles were caught in two traps in 1935, 8 beetles were caught in 12 traps in 1936, and 50 beetles were caught in 26 traps in 1937.

A SCARABAEID (Ochrosidia villosa Burm.)

Connecticut. W. E. Britton (October 22): A lawn damaged by grubs has just been reported from Southport. Last year severe damage occurred at Greenwich and this season the insect has caused similar damage in East Norwalk.

BEET WEBWORM (Loxostege sticticalis L.)

Utah. G. F. Knowlton (October 7): Occurs on Russian-thistle and in cultivated districts in every county of Utah. It was generally common, and the moths abundant during much of the 1937 season.

WHITE-LINED SPHINX (Sphinx lineata F.)

Minnesota. A. G. Ruggles (October 18): Adults extremely numerous until frosts began.

NEVADA BUCK MOTH (Hemileuca nevadensis Stretch.)

Nebraska. M. H. Swenk (October 20): Specimens for identification were sent in from Keith County on October 8.

A CUTWORM (Feltia venerabilis Walk.)

Maine. H. B. Peirson (October 19): Heavy flights of this moth occurred on September 20 on the coast at Bar Harbor.

MONARCH BUTTERFLY (Danaus plexippus Hbn.)

Maryland. E. N. Cory (October 8): Monarch butterflies began to assemble at Piney Point, Saint Marys County, on October 7. On the morning of October 8 it was cold and windy and very few butterflies were in evidence, but as the day progressed and the temperature rose, they reappeared until around 500 were in the neighborhood clustering on various trees preparatory to clustering for the night. The specimens were sprayed with a green dye in the hope that they may be recorded from this cluster at points in their southern travel.

FIVEVINE CATERPILLAR (Papilio philenor L.)

Massachusetts. A. I. Bourne (October 19): Much more abundant than usual. One correspondent stated that she normally found 2 or 3 specimens each year on her vines, whereas this year she had already killed more than 150 larvae. This was the first brood and the second was even more abundant.

CEREAL AND FORAGE - CROP INSECTS

WHEAT

HESSIAN FLY (Phytophaga destructor Say)

Ohio. T. H. Parks (October 26): More than the usual amount of wheat was sowed early this fall but infestation is not serious enough to be a menace.

Missouri. L. Haseman (October 22): While earlier indications showed hessian fly to be relatively scarce throughout central Missouri, we are finding now on volunteer wheat and on early seeded wheat indications of an appreciable infestation. Unhatched eggs were observed today on wheat at Columbia.

Kansas. H. R. Bryson (October 25): Most wheat in southeastern Kansas is in the two-three leaf stage and is reported by R. H. Painter to be free of fly. Near Buffalo, in Wilson County, in a field consisting of wheat of two ages, the older planting was heavily infested.

CHINCH BUG (Blissus leucopterus Say)

South Carolina. F. Sherman and W. C. Nettles (October 16): Started the season strong but subsided during the summer. Farmers have learned more about chinch bug and its control than in any other year to our knowledge.

Illinois. W. P. Flint (October 21): Conditions for second-brood bugs were very favorable, with dry weather during the greater part of August and September. As a result, large numbers of bugs are now in hibernation quarters throughout the central part of the State. No definite survey has yet been made, but casual observations indicate enough bugs to cause severe damage next spring, should a normal winter survival take place.

Kansas. H. R. Bryson (October 23): Reported as having caused some injury to corn at Parsons. They were almost absent in Kansas but built up considerably in the season. Probably a good many will go into hibernation.

Oklahoma. C. F. Stiles (October 22): Chinch bugs are numerous in grain-sorghum fields throughout the central part of the State.

PLAINS FALSE WIREWORM (Eleodes opaca Say)

Nebraska. M. E. Swenk (October 20): A complaint of damage in wheat fields

in Fillmore County was received the second week in October.

Kansas. H. R. Bryson (October 22): False wireworms have caused considerable injury to wheat sown in dry soil. Soil conditions have been more favorable for the larvae this fall than last fall. Reports of injury have been received from Phillips, McLe, Haskell, and Lincoln Counties. Practically all of the counties in the western part of the State have experienced some injury.

A WHITE GRUB (Phyllophaga lanceolata Say)

Kansas. H. R. Bryson (October 23): A report was received of injury to wheat in Kingman County.

Oklahoma. F. A. Fenton (October 19): Reports have been received of white grub infestation of wheat in Medford. The grubs are probably P. lanceolata.

CORN

CORN EAR WORM (Heliothis obsoleta F.)

Maine. H. B. Peirson (October 19): Unusual numbers of moths were in flight on September 16 on the Bar Harbor coast.

Ohio. T. H. Parks (October 26): Late-maturing corn was not as badly injured as in most seasons.

Minnesota. A. G. Ruggles (October 18): None in June. Very abundant toward the end of the season. No damage to tomatoes.

Kansas. H. R. Bryson (October 22): The corn ear worm is reported to be more abundant in southeastern Kansas than it has been for several years. The larvae have been numerous in sorghum heads in most localities.

Texas. R. K. Fletcher (October 10): Larvae found infesting late maturing ears, butter beans, okra, cotton, zinnia, and hogari at Garland in Dallas County. Heaviest on hogari.

SOUTHERN CORNSTALK BORER (Diatraea crambidoides Grote)

South Carolina. F. Sherman and W. C. Nettles (October 16): Several reports of cornstalks falling because of work of the larvae. Such reports are seldom sent us.

BEETLES (Coleoptera)

Utah. G. F. Knowlton (September 29): Sweet corn at Logan is being damaged by the nitidulid Glischrochilus fasciatus Oliv. and the scarabaeid Euphoria inda L. One cob of corn brought in yesterday contained nine nitidulids and four of the scarabaeids. Several findings of this form in sweet corn were received during the season, beginning with the early corn crop.

CARROT BEETLE (Ligyrus gibbosus Deg.)

Tennessee. G. M. Bentley (October 25): Has been reported damaging cornfields in several places.

CORN ROOT APHID (Anuraphis maidi-radiciis Forbes)

South Carolina. F. Sherman and W. C. Nettles (October 16): More abundant than normal. Damage is chiefly in the eastern part of the State.

ALFALFA AND CLOVER

BLACK BLISTER BEETLE (Epicauta pennsylvanica Deg.)

Tennessee. G. M. Bentley (October 25): Has been a real pest in alfalfa fields, and also in young seedings of clover planted in August.

PEA APHID (Illinoia pisi Kltb.)

Maine. J. H. Hawkins (October 17): More pea aphids have been found on red and alsike clover in central Maine this fall than at any time during the last 2 years.

SORGHUM

SORGHUM WEBWORM (Celama sorghiella Riley)

Texas. F. L. Thomas (October 22): Noted on hegari at Garland. Fifteen percent of kaffir heads infested at Alta Loma, Galveston County, on September 1.

LEAF-FOOTED BUG (Leptoglossus phyllopus L.)

Texas. J. N. Roney (October 22): Abundant on sorghum headson August 2 and September 5 in Galveston County.

VELVETBEANS

VELVETBEAN CATERPILLAR (Anticarsia gemmatilis Hbn.)

Florida. J. R. Watson (October 22): Adults are very abundant. The caterpillars are persisting later in the fall than usual, damaging not only velvetbeans and peanuts but also cowpeas. This is the first instance we have noticed of extensive damage to cowpeas by this insect.

Louisiana. B. A. Osterberger and C. L. Stracener (October 5): A trip was made to the North Louisiana Experiment Station, Ouachita Parish, at which time we found a few adults of the velvetbean caterpillar, the first generation of that section.

SUGARCANE

SUGARCANE BORER (Diatraea saccharalis F.)

Texas. F. L. Thomas (October 22): More abundant than usual in Galveston County. Twenty-five borers found in two stalks of cane. Also attacking corn and sorghum in Galveston County on September 1.

FRUIT INSECTS

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

- Massachusetts. A. I. Bourne (October 19): Damage was conspicuous in practically all orchards, even in the best-sprayed ones.
- Virginia. W. S. Hough (October 23): Injury to apple above average in northern Virginia, largely because many growers failed to spray for control of second brood in July.
- South Carolina. F. Sherman and W. C. Nettles (October 16): Some report less damage than usual and yield of apples is far above normal.
- Georgia. C. H. Alden (October 18): In Cornelia all larvae are in winter cases, except a few that are now leaving the ripening fruit. No moths have come to the bait pots since September 25.
- Ohio. T. H. Parks (October 26): One hundred and eleven orchards which had received from 6 to 12 spray applications were checked for insect and disease blemishes. The average percentage of stung fruit in the orchards was 3.5 percent, as compared with 5.6 percent in 1936. In 13 orchards less than one-tenth of 1 percent of the apples bore codling moth blemishes. Ten orchards averaged about 10 percent. The heaviest infestations were in Lawrence and Lucas Counties, where five orchards had over 25 percent of the apples blemished by this insect.
- Michigan. R. Hutson (October 22): Damage was normal or slightly above; however, comparatively large populations of overwintering larvae are present.
- Missouri. L. Haseman (October 22): Moths continued to fly at Columbia until September 28 and then after a lull of several days a few moths were taken on October 19. This is considerably later than previous records indicate, although we frequently have appreciable numbers of moths occurring as late as September 25. In some orchards late-brood larvae were picked up in abundance. Because of their abundance, an appreciable percentage of the winter apples picked in October showed worminess.

RED-BANDED LEAF ROLLER (Argyrotaenia velutinana Walk.)

- Connecticut. P. Garman (October 21): More abundant than usual in New Haven and New London Counties, and doing serious damage in apple orchards where late sprays were omitted. Damaged fruit amounted to 9 percent maximum in one orchard.

APPLE MAGGOT (Rhagoletis pomonella Walsh)

- Maine. F. H. Lathrop (October 20): In Monmouth, Kennebec County, a few flies

are still emerging in experimental cages, although freezing temperatures have occurred. Excellent control was obtained in commercial orchards. Unsprayed trees in general are infested.

West Virginia. L. M. Peairs (October 28): The apple maggot was very abundant in an orchard at French Creek. I saw only the fag-end of the infestation, but a competent entomologist assures me of the presence of the maggots over a considerable period late in the summer. He also stated that adults were numerous enough in the orchard to attract attention.

APPLE APHID (Aphis pomi Deg.)

Maine. F. H. Lathrop (October 20): Dry weather late in the summer caused a great reduction in the numbers of green aphids on apple trees in Monmouth, Kennebec County. Colonies are now difficult to find. Eggs were being deposited on experimental trees late in September and in October.

ROSY APPLE APHID (Anuraphis roseus Baker)

Virginia. W. S. Hough (October 23): This insect caused more damage in May and June in northern Virginia than has been observed since our last aphid year, 1933. At present fall migrants from plantain to apple are moderately numerous in all orchards examined.

LEAFHOPPERS (Cicadellidae)

Massachusetts. A. I. Bourne (October 19): The late brood of white apple leafhopper (Typhlocyba pomaria McAtee) was very abundant generally over the State, and many growers had considerable difficulty in checking them.

Missouri. L. Haseman (October 22): Two or three flights of leafhoppers occurred at Columbia around the middle of October, representing a number of different species. Flights have continued a little later than usual; however, with most fruit, shade, and forest trees still carrying green foliage, it has been possible for leafhoppers to work later than usual.

SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

Virginia. W. S. Hough (October 23): Very scarce. Less prevalent in northern Virginia on apple than has been observed for many years.

Georgia. C. H. Alden (October 18): Adults moderately abundant in Cornelia on peach and some crawlers noted. Light infestation on apple wood and a few scales found on apples being harvested.

Georgia. O. I. Snapp (October 21): Frequent heavy rains in August retarded the infestation which was building up rapidly in July at Fort Valley, central Georgia. The infestation on peach trees is now somewhat less than that of an average year.

Illinois. W. P. Flint (October 21): The weather of the early fall was quite

favorable to the San Jose scale and a considerable increase occurred in the southern part of the State. Indications are that the southern Illinois peach orchards will have to be sprayed this fall.

COMSTOCKS MEALYBUG (Pseudococcus comstocki Kuw.)

Virginia. W. S. Hough (October 23): This mealybug developed to such an extent in a few apple orchards in Frederick & Clarke Counties that much fruit was damaged. The calyx end of some varieties turned black and in other varieties, such as York, both calyx and stem end turned black from the sooty mold which develops in the honeydew secreted by the mealybugs. Large white patches show on the bark, indicating deposition of overwintering egg masses.

PEACH

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Ohio. T. H. Parks (October 26): Almost every peach of varieties maturing in October is infested. Some have more than one larva. No evidence of injury to apples.

Michigan. R. Hutson (October 22): Was held in check by parasites in most peach-growing areas. About South Haven some orchards showed 30-40 per cent damage, notwithstanding the presence of several species of parasites.

Mississippi. C. Lyle (October 23): Heavy infestations have been reported from Jackson, Meridian, and Aberdeen districts.

PEACH BORER (Conopia exitiosa Say)

Georgia. C. H. Alden (October 18): Light infestation at Cornelia. Most orchards have been treated.

O. I. Snapp (October 21): Although there was a moderate infestation of overwintered larvae and resulting adults late in the summer, the indications are that new larvae are at present less abundant than usual in peach trees at Fort Valley. This somewhat light infestation is believed to be due to frequent heavy rains during the early part of the hatching season that undoubtedly prevented many larvae from gaining entrance into peach trees.

LESSER PEACH BORER (Conopia pictipes G. & R.)

Ohio. T. H. Parks (October 26): These insects are causing serious damage to peach trees in parts of Ottawa County. They are now present from very young to almost half-grown borers.

PLUM CURCULIO (Conotrachelus nemoralis Hbst.)

Maine. F. H. Lathrop (October 20): A few adults are appearing in experimental

cages at Monmouth, Kennebec County, although freezing temperatures have occurred. Injury to apples in commercial orchards and on unsprayed trees is distinctly more severe than usual.

Georgia. O. I. Snapp (October 21): Extensive jarring of peach trees by J. R. Thompson on September 23 and 25 showed that most of the adult curculios had left the trees at that time, 3 weeks after the appearance of many second-generation individuals on the same trees. It is not known whether these individuals went to other hosts or locations or into hibernation. A diligent search in woods adjoining peach orchards, under peach prunings, pine limbs, and grass during the latter part of September and the first half of October, failed to locate any adults, although other species of curculios and leaf beetles were found.

BLACK PEACH APHID (Anuraphis persicae-niger Smith)

South Carolina. F. Sherman and W. C. Nettles (October 16): Above average during the year.

CHERRY

SHOT-HOLE BORER (Scolytus rugulosus Ratz.)

Nebraska. M. H. Swenk (October 20): Reported attacking cherry trees in Clay County on September 28.

GRAPE

GRAPE BERRY MOTH (Polychrosis viteana Clem.)

Ohio. T. H. Parks (October 26): This insect is more abundant than usual in the commercial vineyards along Lake Erie.

Michigan. R. Hutson (October 22): Infestation has been severe in Berrien and Van Buren Counties.

PECAN

HICKORY SHUCK WORM (Laspeyresia caryana Fitch)

South Carolina. F. Sherman and W. C. Nettles (October 16): Some damage in eastern part of the State.

OBSCURE SCALE (Chrysomphalus obscurus Comst.)

Mississippi. C. Lyle (October 23): An infestation of obscure scale on pecan was noted at Webb on October 12.

HICKORY NUT

A WEEVIL (Curculio sp.)

Missouri. L. Haseman (October 22): In recent years, hickory nuts through

central Missouri have consistently shown a rather heavy nut weevil infestation. Nuts being gathered at this time show approximately a 5-percent infestation and it seems to be a little lighter on most trees than during the last few years. The hickory nut crop, however, is very heavy, which may account for the apparent reduction in percentage of nuts infested.

WALNUT

WALNUT HUSK FLY (Rhagoletis completa Cross.)

California. D. W. Tubbs (October 19): At the suggestion of D. B. Mackie, I report the finding of the walnut husk fly in Orange County. This is the first year this insect has been reported on the coastal side of the foothills lying between Orange County and the former area of infestation in Los Angeles and San Bernardino Counties. Specimens have been found across the north and northeasterly section of the county, particularly in the eastern and native black walnuts, and also in several commercial plantings of the Persian walnut.

H. J. Ryan (October 21): All of the Eureka variety of walnuts known to be infested in Los Angeles County, and most of the Placentia variety were sprayed. Control was satisfactory and, as compared with last year, was excellent.

WALNUT CATERPILLAR (Datana integerrima G. & R.)

Virginia. H. G. Walker and L. D. Anderson (October 26): The walnut datana was abundant on many walnut and hickory trees at Norfolk during the summer.

Minnesota. A. G. Ruggles (October 18): Reports numerous in September. Not quite as abundant; however, as in 1936.

Oklahoma. F. A. Fenton (October 19): The second brood of the walnut datana completed defoliation of pecan and walnut trees several weeks ago and some trees are beginning to put out a late crop of leaves.

CITRUS

CALIFORNIA RED SCALE (Chrysomphalus aurantii Mask.)

Texas. S. W. Clark (September 20): Causing serious damage to citrus in the Mission-Edinburg section in western Hidalgo County.

California. H. J. Ryan (October 21): Considerable control work was done in August and September and by the first of October a great many groves in Los Angeles County that were thought to be in excellent condition following spring and early summer treatment were carrying an extremely heavy population, which means that a great deal of late fall and early spring control work will be necessary.

DICTYOSPERMUM SCALE (Chrysomphalus dictyospermi Morg.)

Louisiana. I. J. Decnel (October): A light infestation of scales was found in the Louisiana State University grove at Baton Rouge. The specimens were studied by Dr. Harold Morrison and were found to be exceedingly close to C. dictyospermi, but showed slight differences from the characteristic form.

CLOUDY-WINGED WHITEFLY (Dialeurodes citrifolii Morg.)

Florida. J. R. Watson (October 22): The fall brood is on the wing in about the usual numbers.

A CITRUS MITE (Anychus clarkii McG.)

Texas. S. W. Clark (September 29): Extremely abundant in most citrus orchards in the lower Rio Grande Valley.

CITRUS RED MITE (Paratetranychus citri McG.)

California. H. J. Ryan (October 21): Infestations decreased during the latter part of September in Los Angeles County. High temperatures and low relative humidity are generally presumed to have been responsible.

MANGO

MANGO SHIELD SCALE (Coccus mangiferae Green)

Florida. E. W. Berger and G. B. Merrill (October 22): Abundant specimens received from leaves of mango trees at Bokeelia, Pine Island. Judging from the specimens received, a fungus, Aphalosporium lecanii, is controlling the scale.

TRUCK - CROP INSECTS

VEGETABLE WEEVIL (Listroderes obliquus Klug)

- Alabama. J. M. Robinson (October 20): Moderately abundant at Auburn.
- Mississippi. G. L. Bond (October 23): This insect has been injuring turnips at Moss Point during the last 2 weeks.
- Texas. J. N. Roney (September 3): On carrots at Alta Loma in Galveston County, in an old carrot patch that had no cultivation for nearly a year.

CUCUMBER BEETLES (Diabrotica spp.)

- Ohio. T. H. Parks (October 26): Adults of the southern corn rootworm (D. duodecimpunctata F.) were very numerous in September.
- Missouri. L. Haseman (October 22): The spotted cucumber beetle is still moving about and feeding; particularly on late flowers. The striped cucumber beetle (D. vittata F.) ceased work and apparently went into hibernation in central Missouri around October 10.
- Kansas. H. R. Bryson (October 25): Adults of the twelve-spotted cucumber beetles are more abundant than for several years.

BANDED CUCUMBER BEETLE (Diabrotica balteata Lec.)

- Florida. J. R. Watson (October 22): Widely distributed on truck crops in the southern part of the State. In some sections it is doing considerable damage.
- Alabama. J. M. Robinson (October 20): Very abundant on vegetables in central Alabama.
- Texas. J. N. Roney (September 1): Abundant on beans, tomatoes, and beets in Galveston County.

SOUTHERN GREEN STINKBUG (Nezara viridula L.)

- Florida. J. R. Watson (October 22): As during the past 2 years, unusually scarce in the Citrus Belt but unusually abundant in the western part of the State.
- Mississippi. C. Lyle (October 23): Reported injuring cotton at Columbia, butter beans at Jackson, and soybeans and velvetbeans at New Augusta during this month.
- Louisiana. B. A. Osterberger (October 15): The southern green stinkbug is now injuring young peas and beans in all sections of the State. Both adult and nymphal stages are feeding on pods.

Texas. F. L. Thomas (October 22): Observed on tomato, okra, butter beans, and peas in Rusk County, on October 15. Almost impossible to raise late peas.

TURNISHED PLANT BUG (Lygus pratensis L.)

Iowa. H. E. Jaques (October 18): Has been unusually abundant during September and October throughout much of southern Iowa. Their actual damage has probably been negligible, but large numbers on garden plants have proved very annoying.

Kansas. H. R. Bryson (October 23): More abundant this fall than last.

FALSE CHINCH BUG (Nysius ericae Schill.)

Michigan. R. Hutson (October 22): Numerous north of a line from Muskegon to Bay City.

A LEAF-FOOTED BUG (Leptoglossus sp.)

Alabama. J. M. Robinson (October 20): Leaf-leg bug is unusually abundant on field peas and late tomatoes.

MOLE CRICKETS (Gryllotalpa spp.)

Massachusetts. A. I. Bourne (October 19): In late September we received from southern Hampden County (in the Connecticut River Valley just above the Connecticut State line) specimens that proved to be the northern mole cricket (G. hexadactyla Perty), with the complaint that they were very abundant in a planting of potatoes. We visited this outbreak and found that while digging the potatoes the grower had uncovered more than 100 of these insects. Examination of his crop, which amounted to 40 or 50 bushels, showed more than 10 percent of it injured more or less, with many of the potatoes so deeply gouged that they were worthless. This is the first report of these insects occurring in appreciable numbers. We have taken them occasionally on the average of possibly one a season but never in large enough numbers to be considered of economic importance.

Alabama. J. M. Robinson (October 6): Mole crickets are causing considerable concern in gardens at Baker Hill.

Texas. F. L. Thomas (September 1): Mole crickets damaging general truck crops in Galveston County, and in Houston, Harris County, they are attacking dahlias.

TOMATO

TOMATO PINWORM (Gnorimoschema lycopersicella Busck)

Florida. J. R. Watson (October 22): A survey of the tomato fields in the southern part of the State showed the pinworm to be exceedingly scarce.

California. A. E. Michelbacher (October 22): Thousands of tomato fruits have been examined in the San Jose-Santa Clara area during October and approximately one-tenth or 1 percent of them were found to be infested. Last year only 2 specimens were collected, whereas this year no less than 25 have been taken.

CORN EAR WORM (Heliothis obsoleta F.)

California. A. E. Michelbacher (October 22): An examination of our check plots at Santa Clara on October 18 showed that 17 percent of the tomatoes were infested. At Brentwood on October 15 the infestation ran as high as 10 percent. Fields in Sacramento County were surveyed on October 20 and the infestation was found to range from 0.5 percent to 5 percent. The following day an examination of fields in Yolo County showed that the infestation ranged from 5 to 12 percent. Harvest in these two counties is nearly completed.

BEANS

MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

Tennessee. G. M. Bentley (October 25): Generally over the State there has been less injury than for the last several years. However, in certain localities, especially in upland regions of the State, the injury has been serious with untreated beans.

Mississippi. C. Lyle (October 23): Inspectors L. J. Goodgame and N. L. Douglass report serious damage to beans in Monroe and Yalobusha Counties, respectively. Heavy local infestations are reported from Laurel, Meridian, and West Point.

LIMA BEAN POD BORER (Etiella zinckenella Treit.)

Texas. R. K. Fletcher (October 10): Destroyed 50 percent of lima bean pods in Garland, Dallas County.

PEAS

BEET ARMYWORM (Laphygma exigua Hbn.)

California. J. C. Elmore (October 21): Has been very destructive to young pea plants at Riverside. The plants were entirely destroyed in parts of one field. This damage is associated with high temperature (100°F. on October 21).

CABBAGE

DIAMONDBACK MOTH (Plutella maculipennis Curt.)

Virginia. H. G. Walker and L. D. Anderson (October 26): A few larvae of the diamondbacked moth are beginning to appear in some fields of kale and

collards at Norfolk, but it is doubtful whether they will do much damage.

CABBAGE LOOPER (Autographa brassicae Riley)

Texas. J. N. Roney (October 22): On cabbage and collards at Alta Loma, Galveston County, in August. Also abundant on cabbage, cauliflower, and collards in Galveston County on September 1.

S. W. Clark (October 4): Attacking cabbage. Moderately abundant in seedbeds.

CABBAGE WEBWORM (Hellula undalis F.)

Texas. S. W. Clark (October 4): Reported injuring 20 percent of the plants in a cabbage seedbed at Donna, Hidalgo County.

HARLEQUIN BUG (Murgantia histrionica Hahn)

Virginia. H. G. Walker and L. D. Anderson (October 26): Although the harlequin bug has been slightly more abundant this year than last, it has caused very little damage, except in a few isolated instances at Norfolk.

West Virginia. L. M. Peairs (October 28): The harlequin cabbage bug continues to be locally abundant and reports are so scattered that it is doubtless present in most parts of the State, locally as a pest. From about 1915 to about 1930 or 1931 this insect was practically absent from the State. It seems now to have notable reduction in population.

SQUASH

SQUASH BUG (Anasa tristis Deg.)

Minnesota. A. G. Ruggles (October 18): More complaints than usual of damage to cucumbers. The insect is never found north of St. Paul and Minneapolis. One case reported from St. Paul this year.

Iowa. H. E. Jaques (October 18): The squash bug is now going into hibernation in large numbers.

PICKLEWORMS (Diaphania spp.)

Florida. J. R. Watson (October 22): The melonworm and the pickleworm are doing their usual damage to the fall crops of squash and cucumbers.

TURNIP

TURNIP APHID (Rhopalosiphum pseudobrassicae Davis)

Virginia. H. G. Walker and L. D. Anderson (October 26): A heavy infestation was observed at Norfolk in a 10-acre field of Hanover salad, and several cabbage seedbeds have been reported as being rather heavily infested.

Mississippi. C. Lyle (October 23): Reports of aphid injury to turnips have been received from the Meridian, Ocean Springs, and State College districts.

Louisiana. P. K. Harrison (October 19): Not as abundant as in some years at Baton Rouge but increasing in numbers. Damage is light.

Texas. J. N. Roney (October 22): A few wingless forms on turnips and mustard in Galveston County.

CELERY

A PILLBUG (Oniscidae)

South Carolina. J. N. Todd (October 8): The pillbug was found to be injuring a planting of celery at West Union.

PEANUTS

SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata F.)

Virginia. F. W. Poos (September 20): Considerable injury to pods of immature peanuts in the soil; at Holland a very high percentage of the nuts is infested in low damp spots in the fields.

STRAWBERRY

STRAWBERRY CROWN MINER (Aristotelia fragariae Busck)

North Dakota. J. A. Munro (September 17): Reported as pest of strawberry in North Dakota. (Det. by Carl Heinrich.)

SWEETPOTATO

SWEETPOTATO WEEVIL (Cylas formicarius F.)

Texas. F. L. Thomas (October 22): In sweetpotatoes in August at Alta Loma, Galveston County. Adults taken at light in a State Park at Bastrop, Bastrop County, on several occasions from the latter part of September to October 15.

SWEETPOTATO HORNWORM (Herse cingulata F.)

Florida. J. R. Watson (October 22): The sweetpotato sphinx is reported to be doing considerable damage in Bradford County.

PEPPER

PEPPER WEEVIL (Anthonomus eugenii Cano)

Florida. J. R. Watson (October 22): A survey of the bell pepper plants in Manatee County revealed no pepper weevils on the young plants either in

the seedbeds or recently set in the field, but a small plantation of hot peppers, which had been carried through the summer, had a heavy infestation, about 85 percent of the peppers being infested.

BEETS

HAWAIIAN BEET WEBWORM (Hymenia fascialis Cram.)

Virginia. H. G. Walker and L. D. Anderson (October 26): Present in small numbers in spinach at Norfolk but has not caused much damage.

Texas. J. N. Roney (October 22): Abundant on beets, completely destroying the foliage on untreated areas where the crop was not dusted in Galveston County. First appeared in July. This pest has practically eliminated planting of beets as a fall crop in Galveston County.

BEET LEAFHOPPER (Eutettix tenellus Bak.)

Texas. M. J. Janes (October 25): Light migration of beet leafhoppers into the Winter Garden area began October 8. One female taken on 300 square feet of spinach where the leafhoppers were absent during the summer months. Survey indicates that only a small population exists in summer breeding grounds to the northwest.

TOBACCO

TOBACCO WORM (Protoparce quinquemaculata Haw.)

Connecticut. A. W. Morrill, Jr. (October): In the Connecticut River Valley these insects usually appear in greater numbers on the suckers, which are of no commercial importance, than on tobacco plants before harvest. This season, however, was late and much damage was done before harvest. Even on suckers the attack is said by growers to be the worst in 43 years.

C O T T O N I N S E C T S

BOLL WEEVIL (Anthonomus grandis Boh.)

South Carolina. F. Sherman and W. C. Nettles (October 16): Unusual number in spring, population high throughout the season, but heavy infestations were spotted and worse in the eastern section, where loss was severe on some farms.

Georgia. O. I. Snapp (August 20): The boll weevil, rather scarce a month ago, increased rapidly at Fort Valley, central Georgia, during the last 2 weeks with frequent rains, and the infestation now is moderate, although the crop is about made. Some damage is still being done.

Tennessee. G. M. Bentley (October 25): Not a single specimen of the boll

weevil has been reported as being taken in the State this year. Generally numbers not sufficient to cause injury are found in the latter part of August and early in September.

Oklahoma. C. F. Stiles (October 22): The boll weevil has destroyed all of the late crop throughout central and southeastern Oklahoma. There are many times as many weevils in the fields in the southeastern quarter of the State as there were this time last year.

Alabama. J. M. Robinson (October 20): The boll weevil is from scarce to moderately abundant at Auburn.

Mississippi. C. Lyle (October 23): Boll weevils are present in large numbers in cotton fields in all parts of the State. An unusually large number will enter hibernation.

COTTON LEAF WORM (Alabama argillacea Hbn.)

South Carolina. F. Sherman and W. C. Nettles (October 16): We have known only one field that showed noticeable damage. It was in the eastern part of the State.

Georgia. O. I. Snapp (October 21): The cotton leaf worm has been noticeably less abundant this fall at Fort Valley than usual. Only a few specimens have been seen, and the insect has done no damage.

Missouri. L. Haseman (October 4): We observed moths at Columbia on September 27 for the first time this fall. Great numbers of them around apple pomace.

Oklahoma. C. F. Stiles (October 22): Generally present over the entire State, but most of the defoliation occurred in the southeastern part.

Mississippi. C. Lyle (October 23): Still present in the northern and western parts of the State but doing very little damage.

Texas. J. N. Roney (October 22): Moths were attacking figs on September 1 in Galveston and Harris Counties.

SOUTHERN GREEN STINKBUG (Nezara viridula L.)

Florida. H. C. Young (September 29): Approximately 70 acres of cotton 6 miles south of Jay was damaged. In one 40-acre field that had received 500 pounds of commercial fertilizer per acre the yield was only 7 bales, or approximately 270 pounds of seed cotton per acre. The usual production on this land has been from 1,000 to 1,250 pounds per acre. Certain spots, several acres in size, did not produce enough cotton to warrant picking. In some spots the bolls were not attacked until they were about mature and they are still hanging on the plants but were damaged so that they did not open. In other parts of the field only small bolls were to be found. The stinkbugs were so numerous they destroyed the crop before the bolls attained appreciable size. It is possible that some damage

could have been caused by the rapid plant bug (Adelphocoris rapidus Say), as the limbs of the plants are crooked, indicating Adelphocoris work. Farmers reported that the stinkbug attacked the young corn plants and caused many to be distorted. The damage to corn ears was confined to a strip approximately 100 feet wide adjoining a peanut field. The stinkbugs are still present in large numbers attacking the nuts where they are near the surface of the soil. Farmers report that the stinkbugs were fairly abundant last September and October and the mild winter was very favorable for their survival.

COTTON STAINER (Dysdercus suturellus H. S.)

Florida. J. R. Watson (October 22): In certain sections the cotton stainer has been doing some damage to the crop of Sea Island cotton.

F O R E S T A N D S H A D E - T R E E I N S E C T S

GYPSY MOTH (Porthetria dispar L.)

New York. A. F. Burgess (September 30): Some of the men engaged in work on the pine blister rust discovered gypsy moth egg clusters on Trumbull Mountain, in the town of Hague, Warren County. This town adjoins the barrier zone on the west. They report that a gypsy moth colony was found in the township of Southeast, in Putnam County, about $\frac{1}{4}$ mile from a cage where three moths were attracted this summer. About 30 egg clusters have been treated and work will be continued.

FALL CANKERWORM (Alsophila pometaria Harr.)

Iowa. H. E. Jaques (October 18): Showing up as adults where it has been causing trouble on elm and apple. It is probable that the fall flight and resultant egg laying will be unusually heavy.

FALL WEBWORM (Hyphantria cunea Drury)

Massachusetts. A. I. Bourne (October 19): We found that the fall webworm, which is annually quite abundant and conspicuous late in the summer and early in the fall over the State as a whole, was this year comparatively scarce. Not only was it seldom seen in orchards but it was also unusually scarce along the roadsides.

Ohio. F. W. Mendenhall (September 25): Was very abundant last summer and caused some concern.

Tennessee. G. M. Bentley (October 25): This insect as a rule starts its work the latter part of July and continues until killing frost, but this year injury has been very light.

Texas. F. L. Thomas (October 22): Rather abundant on pecan in Robertson, Leon

and Galveston Counties on September 10.

California. K. A. Salman (September 20): Many webs on black walnut shade trees growing along the roadside in Colusa and Princeton, Colusa County, north-central California. Trees damaged by defoliation.

SOUTHERN PINE SAWYER (Monochamus titillator F.)

West Virginia. F. W. Craig (September 28): Attacking hemlocks in a nursery at Huntington. (Det. by A. G. Boving.)

Georgia. T. L. Bissell (October 26): Reports continuing to come in from Griffin and McDonough of injury to deodar cedar due, in part at least, to this species.

WALKINGSTICKS (Phasmidae)

Virginia. R. G. Pierce (October 15): There was an epidemic of walkingsticks, which seemed to have defoliated trees on about 100 acres on Gimlet Ridge, Warren County, between Browntown and Bentonville. There was also a severe defoliation on Pickrel Ridge, Rappahannock County. The trees most heavily defoliated were oak, hickory, and locust.

Minnesota. A. G. Ruggles (October 18): On a farm in Dakota County millions of walkingsticks were denuding young oak, wild cherry, and hazelnut. They were also eating quackgrass.

BEECH

BEECH SCALE (Cryptococcus fagi Baer.)

New York. E. P. Felt (October 23): Found generally present, and on some trees at New Rochelle it was abundant.

BIRCH

BIRCH LEAF-MINER SAWFLY (Phyllotoma nemorata Fall.)

Maine. H. B. Peirson (October 19): Noticeably heavy infestations occurred this year, causing foliage to be well browned and mined at Knox, south-central Maine, and in the Dead River area, in western Maine.

BRONZED BIRCH BORER (Agrilus anxius Gory)

Ohio. E. W. Mendenhall (October 2): In Springfield and Dayton the injury to birch trees is severe.

CATALPA

CATALPA SPHINX (Ceratomia catalpae Bdv.)

South Carolina. F. Sherman and W. C. Nettles (October 16): Occasional trees

have been defoliated but there has been no epidemic. The catalpa tree is neither important nor numerous and we believe that the popular use of the larvae for fish bait is a genuine factor in holding down its numbers on the few trees we have. In many years we have noticed also the effective work of parasites.

Ohio. E. W. Mendenhall (September 30): Nearly all of the catalpa trees throughout central Ohio were defoliated.

ELM

ELM LEAF BEETLE (Galerucella xanthomelaena Schr.)

Ohio. E. W. Mendenhall (September 30): Abundant on all varieties of elm, including the Chinese elms, at Columbus.

ELM BORER (Saperda tridentata Oliv.)

Ohio. E. W. Mendenhall (October 1): Does a great deal of damage to elms where they have been weakened by drought.

TWIG GIRDLER (Oncideres cingulatus Say)

Louisiana. B. A. Osterberger (October 15): A report was received of twigs on very large elms being pruned at Baton Rouge. Upon investigation it was found to be the work of a girdler, perhaps O. cingulatus.

MOURNING-CLOAK BUTTERFLY (Hamadryas antiopa L.)

Minnesota. A. G. Ruggles (October 18): More reports than usual of this insect defoliating elms, particularly Chinese elms, in the northern half of the State.

WOOLLY ELM BARK APHID (Eriosoma rileyi Thos.)

Ohio. E. W. Mendenhall (October 2): Severe on elms in certain localities in Columbus.

EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

Ohio. E. W. Mendenhall (October 2): Severely infesting elm trees, especially young trees, in central Ohio.

California. K. A. Salmon (October 6): Shade trees along the streets of Susanville, Lassen County, northeastern California, found to be infested. Infestation ranging from light to very heavy is general in the town. On some trees twigs are dead or dying, on some whole branches have been killed, and some have yellow foliage.

FIR

AN APHID (Dreyfusia piceae Ratz.)

Oregon. F. F. Keen (September 20): Several dozen ornamental white firs on an

estate near Salem heavily infested. The galls about terminal buds have disfigured and weakened the trees considerably.

A TUSSOCK MOTH (Hemerocampa sp.)

California. K. A. Salman (October 4): This is the second year of defoliation of white fir trees in the mountains east of Adin, Modoc County. Centers of infestation last season were in the vicinity of Rush Creek. This season's infestations were light there but heavier in areas and watersheds east of Rush Creek and Fox Mountain.

HEMLOCK

HEMLOCK LOOPER (Ellopia fiscellaria Guen.)

Maine. H. B. Peirson (October 19): Flight of moths at Bar Harbor on September 20 reported but not as heavy as last year.

LOCUST

LOCUST BORER (Cyllene robiniae Forst.)

New York. R. E. Horsey (October 1): Considerable damage to a planting of ornamental varieties of the common locust at Rochester. In some cases the branches and trunks were well riddled with tunnels. An adult beetle was found today.

Ohio. E. W. Mendenhall (October 2): Locust borers are quite bad in black locust and are doing considerable damage throughout central and southern Ohio.

Iowa. H. E. Jaques (October 18): The adults of the locust borer are fairly abundant on their fall food plant, the goldenrod.

MAPLE

SUGAR MAPLE BORER (Glycobius speciosus Say)

Ohio. E. W. Mendenhall (October 16): Maple trees, especially street trees, severely infested in cities and towns in central Ohio.

TERRAPIN SCALE (Lecanium nigrofasciatum Perg.)

Ohio. J. S. Houser (October): Many examples of encrusted branches of maple have been sent in for determination. This insect is more abundant than it has been for several years. It is widespread over the State.

OAK

TWIG PRUNER (Hypermallus villosus F.)

Massachusetts. A. I. Bourne (October 19): Two years ago this insect was so

abundant that it caused some of the power companies considerable expense on account of short-circuiting caused by infested branches breaking down onto the wires, particularly during storms with high winds. This year we have had practically no complaints and several owners who had been keeping their trees under close observation for the last 2 or 3 years reported that so far as they could discover the pest did not appear this year. In any event it was very scarce.

Ohio. E. W. Mendenhall (October 14): Noticeable where oaks are grown in timber lots and along the streets in central Ohio.

A SAWFLY (Eriocampoides fasciata Nort.)

Iowa. H. E. Jaques (October 18): Has destroyed the mesophyll of half or more of the leaves on two pin oaks on the campus of Iowa Wesleyan, at Mount Pleasant.

OAK LACEBUG (Corythucha arcuata Say)

New York. E. P. Felt (October 23): Disfigured oak leaves at Newburgh.

A GALL INSECT (Neuroterus papillosus Beutm.)

New York. E. P. Felt (October 23): Were extremely abundant on white oak leaves at Pelham and also at East Norwich, Long Island.

PINE

SAWFLIES (Neodiprion spp.)

Ohio. J. S. Houser (September 22 to October 18): N. pinetum Nort. seems to be unusually prevalent this season at Wooster, McArthur, and North Olmsted. Trees 18 feet tall near Wooster were stripped. Insects were feeding abundantly as late as October 6. Many puparia found under trees. Some have gone into the soil $\frac{1}{2}$ inch.

Michigan. R. Hutson (October 22): Larvae of Abbott's sawfly (N. abbotti Leach) and Leconte's sawfly (N. lecontei Fitch) have been numerous, reports coming from Stockbridge, Kalamazoo, Cadillac, Traverse City, Saginaw, and Detroit.

Louisiana. B. A. Osterberger (September 21): A specimen of sawfly was sent in from northern Louisiana, and reported to be injuring young pine. (Det. by R. A. Cushman as Neodiprion, probably lecontei.)

A WEEVIL (Hypomolyx piceus Deg.)

Maine. H. B. Pearson (October 19): On September 12 at Castine, on the central coast, Scotch pine trees were dying from effects of grubs of this weevil working just below ground level, beneath the bark. Grubs were full grown at the time.

PALES WEEVIL (Hylobius pales Hbst.)

New Hampshire. R. B. Friend (October 20): About 70 percent of the white pine trees planted at Keeno last spring, in an area cut in the winter of 1936-37, are already dead. This is probably not an unusual degree of injury for the locality.

PINE NEEDLE SCALE (Chionaspis pinifoliae Fitch)

Utah. G. F. Knowlton (October 10): Ornamental pines and spruce have been heavily infested with pine leaf scale during the current season.

POPLAR

POPLAR TENTMAKE (Ichthyura inclusa Hbn.)

West Virginia. L. M. Peairs (October 28): Has been very abundant on poplars of several species, notably Populus alba, P. grandidentata, and P. tremuloides in many localities in the State. I have observed it from Ohio, Upshur, and Monongalia Counties, also in Jefferson and Berkeley Counties, the Eastern Panhandle. It had been scarce for many years.

INSECTS AFFECTING GREENHOUSE

AND ORNAMENTAL PLANTS

HAIRY CHINCH BUG (Blissus hirtus Montd.)

New York. E. P. Felt (October 23): This season has been marked by its appearance in numbers farther north than usual, notably at Ossining and Bedford.

SOD WEBWORMS (Crambus sp.)

Florida. J. R. Watson (October 22): Sod webworms are still very abundant and destructive to lawns and golf courses. They apparently attack equally all lawn grasses--Bermuda, centipede, carpet, and Saint Augustine.

Louisiana. B. A. Osterberger (October 12): A grass sod worm has been severely injuring lawns and pastures in many sections of southern Louisiana. The larvae have been observed migrating.

CITRUS MEALYBUG (Pseudococcus citri Risso)

Ohio. E. W. Mendenhall (October 15): The mealybugs are abundant and injurious on lantana at Springfield. Treatment given.

COTTONY-CUSHION SCALE (Icerya purchasi Mask.)

North Carolina. Mrs. Albert Brown (October 6): "I cut down a handsome mimosa

tree at Wilmington, which was infested with the scale, and another is completely covered by the pest. English ivy is infested, besides bushes of the shrub 'breath of spring.'"

Georgia. J. M. Robinson (October 20): Moderately abundant on rose bushes at Thomasville on September 21.

WHITE PEACH SCALE (Aulacaspis pentagona Targ.)

Mississippi. C. Lyle (October 23): Specimens of the white peach scale on peach were received from the county agent at Fayette on October 11.

Texas. F. L. Thomas (October 22): This insect is abundant in Harris and Galveston Counties. Has spread to the central part of the State, where it is attacking ornamental shrubs, mulberry, and Chinaberry. It has failed to maintain itself in some locations of central Texas.

AZALEA

A STEM BORER (Oberea myops Hald.)

Delaware. E. P. Felt (October 23): Somewhat common in azalea stems at Wilmington.

CANNA

LARGER CANNA LEAF ROLLER (Calpodes ethlius Cram.)

Massachusetts. A. I. Bourn (October 19): In a rather restricted area around New Bedford, in the extreme southeastern part of the State, considerable damage was being caused to plantings of canna. The species is a rather common pest farther south but so far as I know this is the first report of serious injury in Massachusetts.

CEDAR.

A SCALE (Eriococcus gillettei Tinsley)

Nebraska. M. H. Swenk (October 20): On September 25 a 10-year-old cedar tree in Saunders County was reported to be infested.

EUONYMUS

EUONYMUS SCALE (Chionaspis euonymi Comst.)

Pennsylvania. E. P. Felt (October 23): Somewhat abundant on pachysandra in the Philadelphia area.

GLADIOLUS

THRIPS (Thysanoptera)

Florida. J. R. Watson (October 22): A survey of the young gladiolus plants

in Manatee County revealed a very light infestation of Frankliniella fusca Hinds (tobacco thrips) but none of Teniothrips simplex Morison.

Minnesota. A. G. Ruggles (October 18): Gladiolus thrips are very numerous in untreated plantings this year.

CORN EAR WORM (Heliothis obsoleta F.)

Florida. J. R. Watson (October 22): Was doing more damage to gladiolus than any other insect, mining not only the unopened flowering spikes but in many instances the main stem of the plants. Also damaging young tomato plants by mining the stems.

BEE T ARMYWORM (Laphygma exigua Hbn.)

California. R. E. Campbell (October 22): The infestation in Vista, San Diego County, is extremely heavy and almost ruined a planting of 3 or 4 acres of gladiolus.

LILAC

GIANT HORNET (Vespa crabo L.)

Maryland. E. N. Cory (October 18): Noted on lilac in Kent County. This is a new locality record.

ORCHID

ORCHID WEEVIL (Diorymerellus laevimargo Champ.)

Delaware. H. F. Dietz (October 4): This pest has been causing considerable injury to Cattleyas and Dendrobiums in orchid houses around Wilmington. The injury is greatly out of proportion to the number of beetles it has been possible to collect. This is accounted for by the fact that minor feeding injuries to the roots become infected with an unidentified fungus which results in the death of these roots.

Ohio. E. W. Mendenhall (October 1): Black Diorymerellus was quite bad in an orchid house at Columbus. Treatment was given.

PRIVET

JAPANESE SCALE (Leucaspis japonica Ckll.)

Pennsylvania. E. F. Felt (October 28): Was found in abundance on a privet hedge in the Philadelphia area.

RHODOLENDRON

AZALEA SCALE (Eriococcus azaleae Comst.)

West Virginia. F. W. Craig (September 28): I have never found any scale on

rhododendron in this State until last fall, when it was found on one plant at Moundsville. The plant was sprayed twice last winter with oil. At present there is still live scale on this plant and additional plants have been infested. (Det. by H. Morrison.)

ROSE

ROSE SCALE (Aulacaspis rosae Bouche)

Ohio. E. W. Mendenhall (October 1): Quite bad on roses in certain localities in Franklin County. Stocks were plastered.

INSECTS ATTACKING MAN AND
DOMESTIC ANIMALS

MAN

A SANDFLY (Culicoides canithorax Hoff.)

Georgia. J. B. Hull (September 30): Sandflies, particularly C. canithorax, began emerging at Savannah during the latter part of September; and from the increasing numbers taken in recovery cages it is indicated that the emergence of the fall brood of this pest has begun.

PUSS CATERPILLAR (Megalopyge opercularis S. & A.)

South Carolina. F. Sherman and W. C. Nettles (October 16): Several inquiries, and as usual they are chiefly with reference to stings by the larvae.

Alabama. R. K. Wilson (October 21): Larva received from Dothan for determination. The specimen was taken from the arm of a patient in whom it had produced pain and a local urticaria.

Mississippi. C. Lyle (October 23): Specimens were received from Kosciusko on September 30 and from Wesson on September 23. Inspector N. D. Peets, of Brookhaven, writes that several specimens were brought to his office with the information that the people who had been injured by them experienced severe pain and fever.

Texas. W. E. Dove (October 25): Within 50 miles of San Antonio different persons complained of painful stings of this caterpillar. On several occasions it was encountered in public parks during the month of October.

SADDLEBACK CATERPILLAR (Sibine stimulea Clem.)

Maryland. F. M. Cory (October 1): Seemed to be unusually abundant generally.

TROPICAL RAT MITE (Liponyssus bacoti Hirst.)

Mississippi. J. P. Kisilanko (October 23): Several homes in Wiggins have been

heavily infested with the tropical rat mite.

BLACK WIDOW SPIDER (Latrodectus mactans F.)

North Carolina. B. H. Wilford (October 30): We found one female in the basement of a residence in Asheville. Another female was brought to the office for identification. There were far fewer calls concerning black widow spiders this summer than during the same period of 1936.

Nebraska. M. H. Swenk (October 20): Complaints of, and inquiries concerning, the black widow spider continued to be received during the entire period September 20 to October 20.

DOG

BROWN DOG TICK (Rhipicephalus sanguinius Latr.)

Maryland. E. N. Cory (October 18): We have recently received a report from Towson. One or two records each year for the past 4 or 5 years of invasion of homes by this southern tick.

Illinois. C. L. Metcalf (October 12): We have a report, accompanied by a specimen from Waukegan, of a dog heavily infested.

SUCKING DOG LOUSE (Linognathus piliferus Burm.)

Ohio. J. S. Houser (October 4): Specimens forwarded from Cleveland taken from a dog.

CATTLE

SCREW WORM (Cochliomyia americana C. & P.)

South Carolina. K. Dorward (October 23): Reduced numbers of cases were reported during the month. For the week ended October 8 there were 94 new cases; by October 15 there were 72 new cases; and on October 23, 81 new cases were estimated in the State. The principal infestation continues to be in Colleton County. Single cases occurred in Lexington and Barnwell Counties, the most northern record of the season being 7 miles east of Lexington.

Georgia. R. A. Roberts (October 23): The greater infestation occurs in Seminole and Decatur Counties, also east and south of a line of counties indicated by Grady, Colquitt, Tift, Telfair, and Emanuel. During the last 2 weeks a reduction of approximately 20 percent of the cases first occurred in the southeastern counties and was later in evidence in the southwestern counties. In the northeastern portion, in the vicinity of Bulloch and Emanuel Counties, cases continued with a high incidence.

Florida. R. A. Roberts (October 23): Reports of 1,247 cases, including four representative counties in the State (Madison, Levy, Polk, and Glades)

show progressive decreases in the incidence of cases. The rates of occurrence among 100,000 animals were: October 8, 1,036; October 15, 327; and October 25, 439. The extent of spread of the infestation in western Florida includes 50 cases in the eastern portion of Jackson County. No cases were found west of Marianna.

Alabama. R. A. Roberts (October 23): During the past 2-week period 25 cases occurred in Houston County, but were treated promptly. They were reported in the vicinity of Cottonwood and Crosby, and specimens were identified from Gordon. On October 26 no new cases were found in Houston and Henry Counties nor in the stockyards at Montgomery.

Missouri. G. D. Jones (October 18): Last week the county agent in Jackson County reported several cases in that county this fall.

Kansas. W. E. Dove (October 25): Three hundred and forty-five cases were reported in Butler County by the county agent.

Texas. W. E. Dove (October 30): In the southern counties of Texas 5,461 cases were reported among 1,044,245 animals for the 4-week period ended October 23. Localized outbreaks occurred in portions of Willacy, Kenedy, Kleberg, Bee, Refugio, Victoria, Calhoun, Jackson, and Matagorda Counties. Of these, 4,687 cases were attributed to bites of the Gulf coast tick (Amblyomma maculatum Koch.). Other counties reporting localized outbreaks were Kinney, Bastrop, Taylor, Fisher, and Dawson. From questionnaires received from 73 counties, 23 reported no cases during the month ended October 15. From 50 counties 1,311 cases were reported by stockmen among 92,986 animals, or at the rate of 1,409 cases in 100,000 animals. Cases were of rare occurrence in eastern and northern Texas. Normally screw-worm cases are most numerous in Texas from early September until frost, but this year and last year are said to be exceptions. Some stockmen say that screwworms are less numerous this year than at any time during the past 18 years.

Illinois. W. E. Dove (October 30): About 600 cases were treated in Menard County since the middle of July. Specimens from one case at Springfield were identified, and one case was reported from Sangamon County.

GULF COAST TICK (Amblyomma maculatum Koch)

Alabama. J. M. Robinson (October 20): A female of the Gulf coast tick was taken from the ear of a cow at Citronelle on October 5.

HORSE

HORSE BOTFLIES (Gastrophilus spp.)

Texas. F. C. Bishopp (October 18): About 6 o'clock this evening adults of G. intestinalis Lag. were observed to be very active laying eggs on horses on a farm near Uvalde. The horses were rather heavily infested with eggs, these being very abundant on the inside of the front legs and reasonably

abundant on the outside of the legs, on the breast, shoulders, and neck. One specimen of G. nasalis L. was observed to be ovipositing under the jaws of one of the horses. A moderate number of eggs of this species were present on this group of animals. D. C. Parman, of the Uvalde laboratory, states that the bot eggs are much more numerous on the horses this year than they were last, and last year he reported that bots had not been observed on horses in the vicinity of Uvalde for some years previously.

SHEEP

SHEEP BOTFLY (Oestrus ovis L.)

Texas. O. G. Babcock (October): The sheep nose botflies apparently were not very active during the past summer months at Sonora, but are appearing in greater numbers this fall.

HOUSEHOLD AND STORED-PRODUCTS INSECTS

TERMITES (Reticulitermes spp.)

Massachusetts. A. I. Bourne (October 19): We had one instance brought to our attention where termites were found to be attacking the roots of living pine trees. This rather unusual outbreak occurred in South Harwich, which is well on toward the eastern end of Cape Cod.

Illinois. W. P. Flint (October 21): Reports of termite damage continue to be received from all parts of central and southern Illinois.

Tennessee. G. M. Bentley (October 10): In strawberry fields in and around those sections where there have been piles of wood or decayed stumps, appreciable damage by termites has been done to strawberry plants.

Alabama. J. M. Robinson (October 4): Termites were reported as seriously damaging the flooring in mills at Anniston. At Tallassee they destroyed the paneling in the dining room of a \$40,000 residence.

Missouri. L. Haseman (October 22): Normally at this season termites are readily found for class work in practically any wood that has been lying on the ground for any length of time, but this fall they seem to be much scarcer than usual, indicating perhaps a tendency to cease feeding early due to the continued cool weather throughout the month.

Nebraska. M. H. Swenk (October 20): Complaints of damage by termites, R. tibialis Banks, were received from Otoe, Box Butte, and Kearney Counties.

Texas. F. L. Thomas (October 22): Termites causing damage in Texarkana, Bowie County, September 20; also at Big Spring in Howard County, September 25.

Nevada. G. G. Schweis (October 20): An infestation of termites occurred in a dwelling in Sparks and caused enough damage that it will be necessary to

rebuild a portion of the house. The termite situation is rather unusual in western Nevada as up to about 3 years ago there were practically no infestations reported to the entomologist's office. The last 3 years, however, we have had several cases where the damage has been extensive enough to necessitate rebuilding of at least a portion of the infested building.

Oregon. R. L. Furniss (September 3): A large and recently constructed house in Portland was found to be infested with the subterranean termite, R. hesperus Banks. Rarely reported in Portland.

HOUSE CRICKET (Gryllus domesticus L.)

Minnesota. A. G. Ruggles (October 15): Complaints from housewives of the crickets invading houses. Very abundant in Jackson County.

ARGENTINE ANT (Iridomyrmex humilis Mayr)

Mississippi. C. Lyle (October 23): Specimens were received from Prentiss on October 4. Also these ants are reported causing trouble in the Durant territory.

BOXELDER BUG (Leptocoris trivittatus Say)

Michigan. R. Hutson (October 22): Boxelder bugs are numerous at Fenton, Farmington, Ann Arbor, and Manchester.

Minnesota. A. G. Ruggles (October 18): Reports just beginning to come in this month. Reports show them to be as abundant as in other bad years.

Iowa. H. E. Jaques (October 18): Continues to be very annoying in many regions throughout southern Iowa.

Kansas. H. R. Bryson (October 23): This species is more abundant at Manhattan than last, judging from the numbers seeking hibernating quarters on the south side of buildings.

STRAWBERRY ROOT WEEVIL (Brachyrhinus ovatus L.)

Minnesota. A. G. Ruggles (October 18): Several reports of damage to evergreens but more from housewives of the adults getting into houses.

POWDER POST BEETLES (Lyctus spp.)

Maryland. E. N. Cory (October 18): Found in house in Crisfield.

Virginia. H. G. Walker and L. D. Anderson (October 26): Several buildings in and near Norfolk have been rather heavily infested this year.

Michigan. R. Hutson (October 22): Powder post beetles have been reported from Three Rivers, Cassopolis, Benton Harbor, and Kalamazoo.

WHITE-MARKED SPIDER BEETLE (Ptinus brunneus Dufts.)

Ohio. T. H. Parks (August 30): Adults and larvae were received from Urbana with the statement that they were abundant in hog food containing oil meal, tankage, and other ingredients. They were also eating holes in the bags and causing loss of the feed. The feed had been in storehouse only 40 days.

ANOBIIDS (Coleoptera)

Connecticut. N. Turner (October 4): At Middletown floor badly damaged by Anobium punctatum Deg. The flooring was apparently native lumber. Scraps of wood in the basement and newly built basement partitions were also attacked. (October 22): Two colonial buildings in the State were examined within a week and found seriously infested with Xestobium rufo-villosum Deg.

A DERMESTID (Dermestes cadaverinus F.)

Louisiana. M. D. Leonard (September 13): Specimens from Shreveport were sent in for identification stating that a considerable infestation was found.

CIGARETTE BEETLE (Lasioderma serricorne F.)

Nebraska. M. H. Swenk (October 20): The cigarette beetle or tow-bug was reported to be found all through a house in Douglas County on September 23, while on October 18 this pest was infesting overstuffed furniture in Jefferson County.

CONFUSED FLOUR BEETLE (Tribolium confusum Duv.)

Iowa. H. E. Jaques (October 18): Complaints of the confused flour beetle as a pest of local flour bins have been received from Mt. Pleasant.

PEA WEEVIL (Bruchus pisorum L.)

Iowa. H. E. Jaques (October 18): Pea weevils have been reported with their usual destruction to garden peas.

A LATHRID (Cartodere costulata Reit.)

Connecticut. E. P. Felt (October 23): Was reported abundant in a Stamford dwelling to such an extent as to cause apprehension. They were sufficiently numerous on the walls that they were comparatively easy to capture. It developed that the house had been closed during a portion of the summer and was unusually damp and moldy.

INDIAN-MEAL MOTH (Plodia interpunctella Hbn.)

Iowa. H. E. Jaques (October 18): Has been making its appearance in homes and grocery stores where it is a pest in food products.

BOOKLOUSE (Troctes divinatorius Mull.)

New York. M. D. Leonard (October): Present in such great numbers over a period of several weeks this fall in apartments and dwellings in New York City as to elicit several newspaper accounts of the infestations.

INSECT CONDITIONS IN PUERTO RICO

By G. N. Wolcott
Insular Experiment Station, Rio Piedras

The past spring and summer in the more humid part of Puerto Rico has been unusually dry, and the autumnal rains have been less than normal. The chinch bug (Blissus leucopterus Say) was noted in considerable abundance on the upper leaves of young sugarcane plants at Rio Grande and Canovanas a few days ago, something I have never seen before.

An outbreak of the pyralid caterpillar, Pyrausta cerata F. (= Epicorsia mellinalis Hbn.) on the leaves of the pendula tree, Citharexylum fruticosum, has recently been noted at Humacao, Maunabo, and Arroyo, in the southeastern corner of the island, and also at Bayamon, Cayey, and Caguas in the interior, and at Isabela and Aguadilla in the northwestern corner, presumably being general wherever the host tree is present.

INSECT CONDITIONS IN GUAM -- JULY AND AUGUST 1937

By R. G. Oakley
Agana, Guam

The attacks of the melonfly (Bactrocera cucurbitae Coq.) probably of recent introduction into Guam, were general in most community centers and in a few isolated cucurbit fields during July. Infestations reached as high as 100 percent in some cases. The prevalence of wild papayas over the island and a local cultivation practice of often abandoning cucurbit fields to weedy growth and the development of small melons after the commercial crop is picked, is very favorable to the development of a large population.

The bean leaf roller (Lamprosema diemenalis Guen.) was very abundant on string beans and as a minor pest on other legumes in July. It was not uncommon to find 50 percent of the leaf surface of string beans infested. (Det. by O. H. Swezey.)

A squash bug, Leptoglossus membranaceus F., commonly infesting a number of hosts, was doing considerable damage to cucurbits and string beans in July and August. In one field dozens of bursted watermelons were completely covered

and hundreds were feeding heavily on papaya seedlings. (Det. by H. G. Barber.)

The chrysomelid Phytorus pinguis Baly. has been observed to be the most prolific insect every to have been seen by the writer. Its attacks are especially severe on breadfruit and mango, the latter being often defoliated. Four wild hosts are also heavily infested and a number of others seem to be satisfactory hosts. It is sometimes found doing minor damage to vegetable crops. No immature stages have been found as yet. (Det. by O. H. Swezey.)

LIBERATIONS OF JAPANESE BEETLE PARASITES IN THE
EASTERN STATES IN 1937

By J. L. King, ^{1/} senior entomologist
Division of Fruit Insect Investigations
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This report includes in tabular form the present and former liberations of three of the major species and one racial form of the parasites of the Japanese beetle as distributed in nine States. The arrangement of the tables shows the distribution of parasite colonies in the States and counties, also the annual progress in these areas. Grand totals are given for combined States. Where parasite colonies are 3 years old (liberated in 1934) or older their recovery status is also indicated.

Although five species and one racial form are known to be established, two species, namely, Dexia ventralis Ald. and Prosenia siberita F., are not included in this report because neither has been actively colonized since 1934 or earlier. Both these species are feebly established in New Jersey but, because of limitations in their ability to become established, further active distribution of the species has been held in abeyance until more favorable conditions for their colonization may be found.

Tiphia vernalis Roh.--From 1926 to 1937, 811 colonies of this parasite were liberated in the field, 161 of these being liberated in 1937. For the most part, these colonies have consisted of units of 100 mated females at each releasement, the exceptions being the early colonies of imported material, which were much larger, ranging from 300 to 500 females per colony. The catch of 16,100 females of T. vernalis in 1937 is the largest collection since the work began, as is shown in table 1, and in the diagram illustrating the annual colonization of this species.

Scouting for recovery or establishment has followed releasement 3 years after the date of initial liberation. In the case of T. vernalis, out of a total of 351 liberations made during the years 1926 to 1934,

^{1/} The writer acknowledges the assistance of his associates, T. R. Gardner, L. B. Parker, M. H. Brunson, and I. M. Hawley, who were actively engaged in the work of colony distribution and recovery scouting.

inclusive, 223 colonies have been recovered. Therefore we are certain that at least 53.5 percent of the colonies became established. It is believed that if more time could be spent in scouting, a higher percentage of recovery would be indicated.

Studies conducted in 1937 at the Overbrook Country Club in Pennsylvania of the parasitization caused by T. vernalis show that in diggings of 115 square feet over the entire golf course the host-grub population averaged 0.77 grub per square foot and that the average parasitization for this area was 31.4 percent. In one limited area of 40 square feet where the host averaged 1.33 grubs per square foot, parasitization ran as high as 66 percent.

Tishia poeciliivora Roh.--The total number of colonies for this species is 533 (see table 2). Most of these date from 1927, having been collected from early established colonies (see diagram of annual colony distribution). Unfortunately, the collection of adults for distribution in 1936 dropped to 4,400 females and in 1937 to 2,600, thus permitting the distribution of only 44 colonies in 1936 and 26 in 1937. This drop in abundance is attributed to a marked decline in host population in the older area infested by the Japanese beetle. It is expected, however, that collection may be augmented in the future by drawing from colonies in the outer areas where the host is more abundant.

Scouting to determine the percentage of colony establishment for this species of all colonies 3 years old or older shows that of 378 colonies under consideration, 131, or 34.5 percent, were recovered. As in the case of T. vernalis, more time spent in scouting would doubtless increase the percentage of establishment.

Surveys to determine the effectiveness of this species have not been satisfactory because they have been too limited in area. It has been impossible to locate suitable areas for survey where the resulting turf injury is not objectionable to the owner. In 1935, in digging 91 square feet at the Llanerch Country Club in Pennsylvania, host larvae were found to be abundant, yet only 3.9 percent were parasitized; however, this percentage did not seem commensurable with the abundance of parasites in the field. It is generally conceded that parasitization is "spotty" and if surveys are not extensive enough to include some of the areas of heavy parasitization, no adequate idea of the effectiveness of the species can be gained.

Tishia poeciliivora Roh. (Korean strain).--This racial form of the Japanese beetle is from Chosen (Korea). It has been more recently introduced and has been colonized in 30 different locations in 4 States (see table 3). This strain or race is seasonally later, occurring from 2 to 3 weeks after the type; therefore it has been reasoned that it should be more properly synchronized with the appearance of third-stage host larvae, and, therefore, should be more useful than the type strain in certain areas south of the area now infested by the Japanese beetle. Most of the colonies of this parasite are so recent in origin that extensive scouting has not yet been conducted.

Centeter cinerea Ald.--This is the only dipterous parasite of the Japanese beetle which has become established over a wide area. It is a parasite of the adult beetle. A total of 22 colonies of this parasite were liberated from 1922 to 1937, inclusive (see table 4). A number of these colony centers in New Jersey and Pennsylvania have coalesced so that the fly is now found over a continuous area of 500 square miles. Not all of the initial liberations of this species have become established, as checks from time to time indicate that only 59 percent of the colonies have taken hold, while others have died out.

The species has been liberated in four States. The colonies in Connecticut and New Hampshire are somewhat experimental in nature to determine whether the parasite will be of more value there than it is in New Jersey and Pennsylvania. In the last-named States Centeter is not synchronized with its host, as it constantly appears before beetles become abundant. Thus in June parasitization of the host may reach 27.5 percent on the 5th, gradually declining to 5 percent on the 30th and dropping to 2.2 percent on July 6. After that it soon disappears.

Table 1.--Litterations and recoveries of *Tiphia vernalis* Roh., a Japanese beetle parasite

State and county	Colonies released in --												Recovery of colonies 3 years old or older Number	Status 1937	Recovery of colonies scouted Percent	Total 1926-37
	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937				
Connecticut:																
Fairfield-----	--	--	--	--	--	--	--	--	--	--	3	2	--	--	--	5
New Haven-----	--	--	--	--	--	--	--	--	--	--	1	2	--	--	--	3
New London-----	--	--	--	--	--	--	--	--	--	--	--	1	--	--	--	1
Total-----	--	--	--	--	--	--	--	--	--	--	4	5	--	--	--	9
Delaware:																
New Castle-----	--	--	--	--	--	--	--	--	5	6	22	5	5	5	--	38
Kent-----	--	--	--	--	--	--	--	--	--	--	4	--	--	--	--	4
Total-----	--	--	--	--	--	--	--	--	5	6	26	5	5	5	100	42
District of Columbia:																
(Washington)-----	--	--	--	--	--	--	--	--	1	--	--	--	1	0	--	1
Total-----	--	--	--	--	--	--	--	--	1	--	--	--	1	0	0	1
Maryland:																
Baltimore City-----	--	--	--	--	--	--	--	--	1	--	3	--	1	1	--	4
Cecil-----	--	--	--	--	--	--	--	--	1	--	3	24	1	1	--	28
Dorchester-----	--	--	--	--	--	--	--	--	--	--	1	--	--	--	--	1
Frederick-----	--	--	--	--	--	--	--	--	--	--	1	--	--	--	--	1
Washington-----	--	--	--	--	--	--	--	--	--	--	1	--	--	--	--	1
Total-----	--	--	--	--	--	--	--	--	2	--	9	24	2	2	100	35
Massachusetts:																
Hampden-----	--	--	--	--	--	--	1	1	--	--	--	1	2	1	--	3
Total-----	--	--	--	--	--	--	1	1	--	--	--	1	2	1	50	3

Table 1.--Liberations and recoveries of *Tiphia vernalis* Roh., a Japanese beetle parasite.--(Continued)

State and county	Colonies released in --												Recovery of colonies 3 years or older Number scouted	Recovery of colonies scouted Percent	Total 1926-37
	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937			
New Hampshire:															
Cheshire	--	--	--	--	--	--	--	--	--	--	--	1	--	--	1
Merrimac	--	--	--	--	--	--	--	--	--	--	1	--	--	--	1
Strafford	--	--	--	--	--	--	--	--	--	--	1	--	--	--	1
Total	--	--	--	--	--	--	--	--	--	--	2	1	--	--	3
New Jersey:															
Atlantic	--	--	--	--	--	--	--	--	--	1	--	--	--	--	3
Burlington	1	--	2	1	1	--	--	9	9	4	--	--	23	12	27
Camden	--	2	--	--	--	--	1	6	--	--	--	--	9	9	9
Cape May	--	--	--	--	--	--	--	--	5	--	2	--	--	--	2
Cumberland	--	--	--	--	--	--	--	--	--	1	--	--	5	4	6
Gloucester	--	--	--	--	--	--	4	6	--	3	--	--	10	6	13
Hunterdon	--	--	--	--	--	--	--	--	--	16	20	2	--	--	38
Mercer	--	--	--	--	--	--	5	24	17	6	--	--	46	23	52
Middlesex	--	--	--	--	--	--	--	1	1	7	5	9	2	2	23
Monmouth	--	--	--	--	--	--	--	2	10	6	--	--	12	7	18
Ocean	--	--	--	--	--	--	--	3	1	--	--	--	4	1	4
Salem	--	--	--	--	--	--	2	10	1	5	--	--	13	7	18
Somerset	--	--	--	--	--	--	--	1	5	12	--	--	6	4	58
Union	--	--	--	--	--	--	--	--	--	--	--	11	--	--	17
Total	1	2	2	1	1	12	62	49	60	59	40	130	75	57.6	139
New York:															
Nassau	--	1	--	--	--	--	--	--	--	--	--	--	--	--	1
Queens Borough	--	--	--	--	1	--	--	--	--	--	--	--	1	1	1
Staten Island	--	--	--	--	--	--	--	--	--	--	10	--	--	--	10
Total	--	1	--	--	1	--	--	--	--	--	10	1	1	100	12

Table 1.--Liberations and recoveries of *Tritia vernalis* Bon., a Japanese beetle parasite. (Continued)

State and county	Colonies released in --													Recovery of colonies 3 years old or older		Recovery of colonies scouted Percent	Total 1934-37
	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937				
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Pennsylvania:																	
Berks	--	--	--	--	--	--	9	8	15	18	--	25	24	--	--	--	3
Bucks	--	--	--	--	3	--	--	2	2	15	26	22	22	53	26	--	123
Chesster	--	--	--	--	--	--	--	--	--	1	36	--	--	17	14	--	97
Cumberland	--	--	--	--	--	--	--	--	--	1	--	--	--	1	1	--	1
Dauphin	--	--	--	--	--	--	--	--	--	1	--	--	1	1	1	--	2
Delaware	--	--	--	--	--	--	1	9	9	23	11	--	--	42	24	--	53
Lehigh	--	--	--	--	--	--	--	--	--	--	--	1	1	--	--	--	1
Monroe	--	--	--	--	--	--	--	--	--	--	--	2	--	--	--	--	2
Montgomery	--	--	1	1	2	4	1	19	13	40	1	6	25	81	59	--	113
Philadelphia	--	--	--	--	--	1	--	7	6	1	1	--	--	15	13	--	16
Total	--	1	1	1	5	5	11	45	45	97	75	56	75	210	139	65.2	413
Rhode Island:																	
Providence	--	--	--	--	--	--	--	--	--	--	--	1	--	--	--	--	1
Total	--	--	--	--	--	--	--	--	--	--	--	1	--	--	--	--	1
Grand Total	1	4	3	6	7	11	11	58	105	154	141	157	161	351	223	63.5	811

Table 2.--Liberations and recoveries of *Tiphia popillivora* Roh., a Japanese beetle parasite

State and county	Colonies released in --													Recovery of colonies 3 years old or older number scouted	Recovery of colonies scouted	Total 1921-37
	1921	1922	1925	1927	1928	1929	1930	1931	1934	1935	1936	1937				
Connecticut:																
Fairfield -----	--	--	--	--	--	--	--	--	--	--	--	4	--	--	--	4
New Haven -----	--	--	--	--	1	--	--	--	--	--	--	--	--	--	--	--
Hartford -----	--	--	--	--	--	--	--	--	--	--	--	2	--	--	--	--
Total -----	--	--	--	--	1	--	--	--	--	--	--	6	--	--	--	7
Delaware																
New Castle -----	--	--	--	--	--	--	--	--	4	5	14	8	4	2	--	--
Total -----	--	--	--	--	--	--	--	--	4	5	14	8	4	2	50	31
Maryland:																
Cecil -----	--	--	--	--	--	--	--	--	1	3	--	7	1	0	--	11
Total -----	--	--	--	--	--	--	--	--	1	3	--	7	1	0	0	11
New Jersey:																
Burlington -----	2	1	1	4	12	24	--	13	5	5	--	--	62	31	--	67
Camden -----	--	--	--	2	2	1	1	2	--	1	--	--	8	4	--	9
Gloucester -----	--	--	--	1	--	14	--	1	--	7	--	--	16	2	--	23
Hunterdon -----	--	--	--	--	--	--	--	--	--	4	14	--	--	--	--	18
Mercer -----	--	--	--	--	1	1	--	4	37	5	1	--	43	16	--	49
Middlesex -----	--	--	--	--	--	--	--	--	3	2	--	--	3	0	--	5
Monmouth -----	--	--	--	--	--	--	--	--	--	1	--	--	--	--	--	1
Salem -----	--	--	--	--	--	--	--	5	--	15	--	--	5	1	--	20
Somerset -----	--	--	--	--	--	--	--	--	3	24	2	--	3	2	--	31
Total -----	2	1	1	7	15	40	1	25	48	64	17	2	140	56	40	223

Table 2.--Liberations and recoveries of *Tiphia popillivora* Roh., a Japanese beetle parasite -- (Continued)

State and county	Colonies released in --												Recovery of colonies 3 years old or older Number Status scouted 1937	Recovery of colonies scouted Percent	Total 1921-37	
	1924	1922	1925	1927	1928	1929	1930	1931	1934	1935	1936	1937				
New York:																
Massau	--	--	--	1	1	--	--	--	--	--	--	--	2	0	--	2
Queens Borough	--	--	--	--	1	--	--	--	--	--	--	--	1	0	--	1
Total -----	--	--	--	1	2	--	--	--	--	--	--	--	3	0	0	3
Pennsylvania:																
Bucks	--	--	--	1	4	22	--	5	31	41	8	--	63	23	--	112
Chester	--	--	--	--	--	--	1	--	15	5	4	3	16	9	--	28
Cumberland	--	--	--	--	--	--	--	--	1	--	--	--	1	0	--	1
Dauphin	--	--	--	--	--	1	--	--	1	--	--	--	2	0	--	2
Delaware	--	--	--	--	4	10	--	--	38	--	--	--	52	32	--	52
Montgomery	--	--	--	--	7	19	--	13	46	15	--	--	85	55	--	100
Philadelphia	--	--	--	2	--	9	--	--	--	1	1	--	11	9	--	13
Total -----	--	--	--	3	15	61	1	18	132	62	13	3	230	133	57.8	308
Grand total--	2	1	1	11	33	101	2	43	135	134	44	26	378	191	50.5	583

Table 3.-- Liberations and recoveries of *Ilimia psocillivora* Roh. (Korean strain),

a Japanese beetle parasite--

State and County	Colonies released in					Colonies recovered	Total 1927-37
	1927	1934	1935	1936	1937		
<u>Delaware:</u>							
New Castle	--	--	--	--	3	0	3
Total	--	--	--	--	3	0	3
<u>Maryland:</u>							
Cecil	--	--	--	--	1	0	1
Total	--	--	--	--	1	0	1
<u>New Jersey:</u>							
Camden	1	1	--	--	--	1	2
Hartford	--	--	4	--	--	0	4
Jersey	--	--	1	--	--	1	1
Milford	--	--	--	1	--	0	1
Summit	--	--	--	2	3	0	5
Total	1	1	5	3	3	1	13
<u>Pennsylvania:</u>							
Montgomery	--	--	3	--	--	0	3
Philadelphia	--	--	1	--	--	0	1
Delaware	--	1	--	--	--	1	1
Charter	--	--	--	2	2	0	3
Total	--	1	4	2	2	1	10
Grand total--	1	2	3	2	2	*3	13

*Extensive searching for recovery of this species has not been started.

Table 4. --- Liberations and recoveries of *Centeter cinerea* Ald.,

a parasite of the Japanese beetle

State and county	Colonies released in ---								Colonies recovered	Total 1922-37
	1922	1924	1928	1929	1934	1935	1936	1937		
Connecticut:										
Fairfield -----	--	--	1	1	--	--	--	--	1	2
Hartford -----	--	--	--	--	--	--	--	1	--	1
Total -----	--	--	1	1	--	--	--	1	1	3
New Jersey:										
Burlington -----	--	--	--	2	--	--	--	--	1	2
Camden -----	1	--	--	--	--	--	--	--	1	1
Hunterdon -----	--	--	--	--	1	--	--	--	1	1
Middlesex -----	--	--	--	--	1	--	--	--	1	1
Total -----	1	--	--	2	2	--	--	--	4	5
Pennsylvania:										
Berks -----	--	--	--	--	--	1	--	--	1	1
Bucks -----	--	1	--	1	1	--	--	--	2	3
Dauphin -----	--	--	1	3	--	--	--	--	1	4
Delaware -----	--	--	--	1	--	--	--	--	0	1
Montgomery -----	--	--	1	1	1	--	--	--	3	3
York -----	--	--	--	1	--	--	--	--	0	1
Total -----	--	1	2	7	2	1	--	--	7	13
New Hampshire:										
Cheshire -----	--	--	--	--	--	--	1	--	1	1
Total -----	--	--	--	--	--	--	1	--	1	1
Grand total ---	1	1	3	10	4	1	1	1	13 (59%)	22

TIPHIA VERNALIS

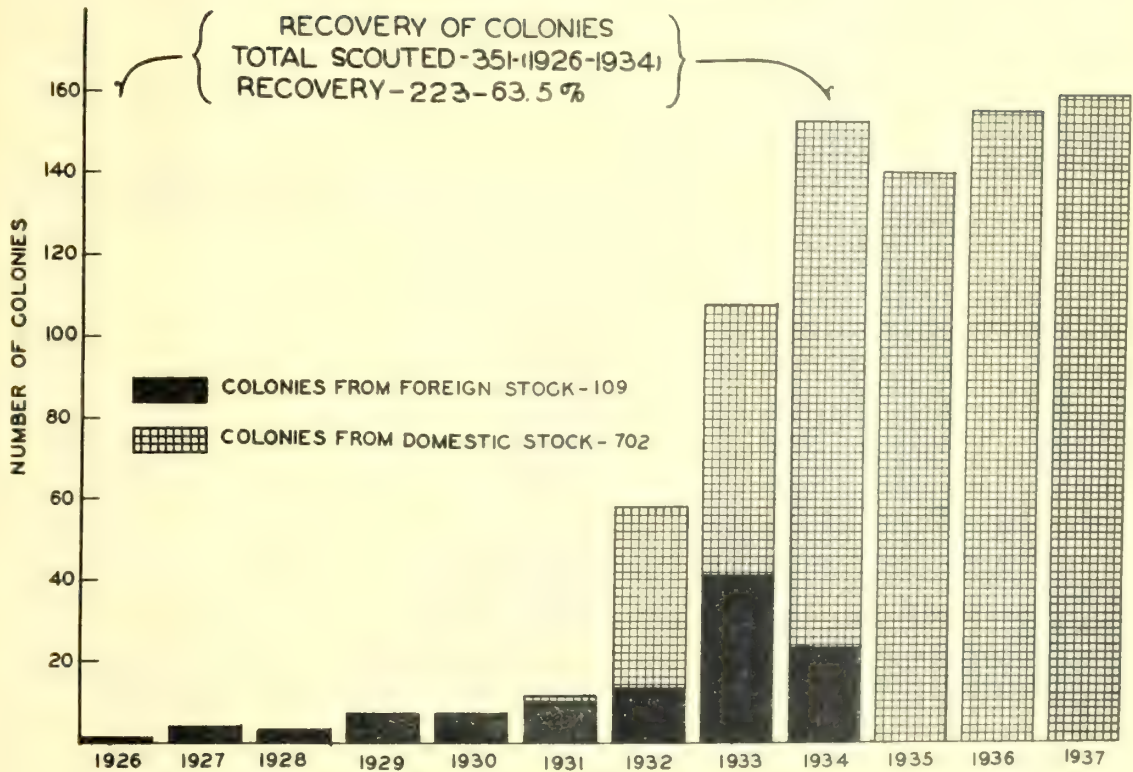


Diagram of the annual colonization of Tiphia vernalis Roh. Each colony consists of 100 or more female Tiphia.



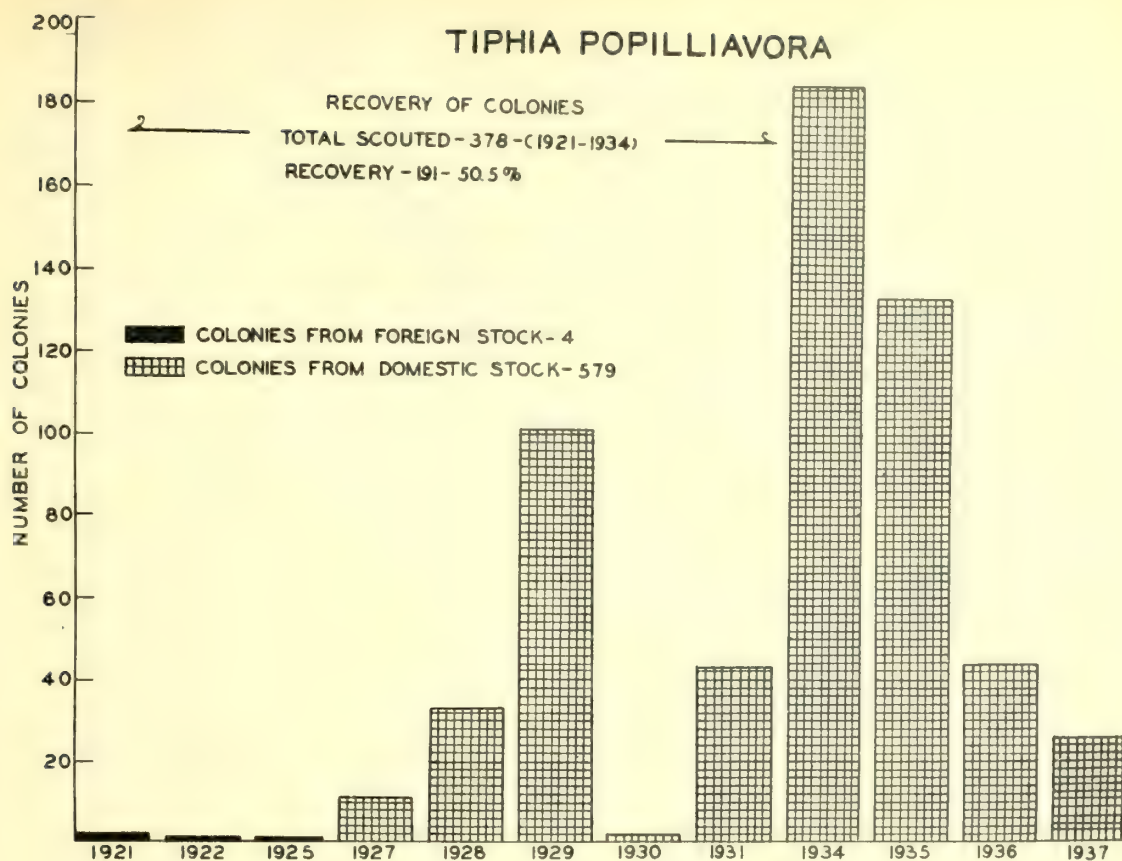
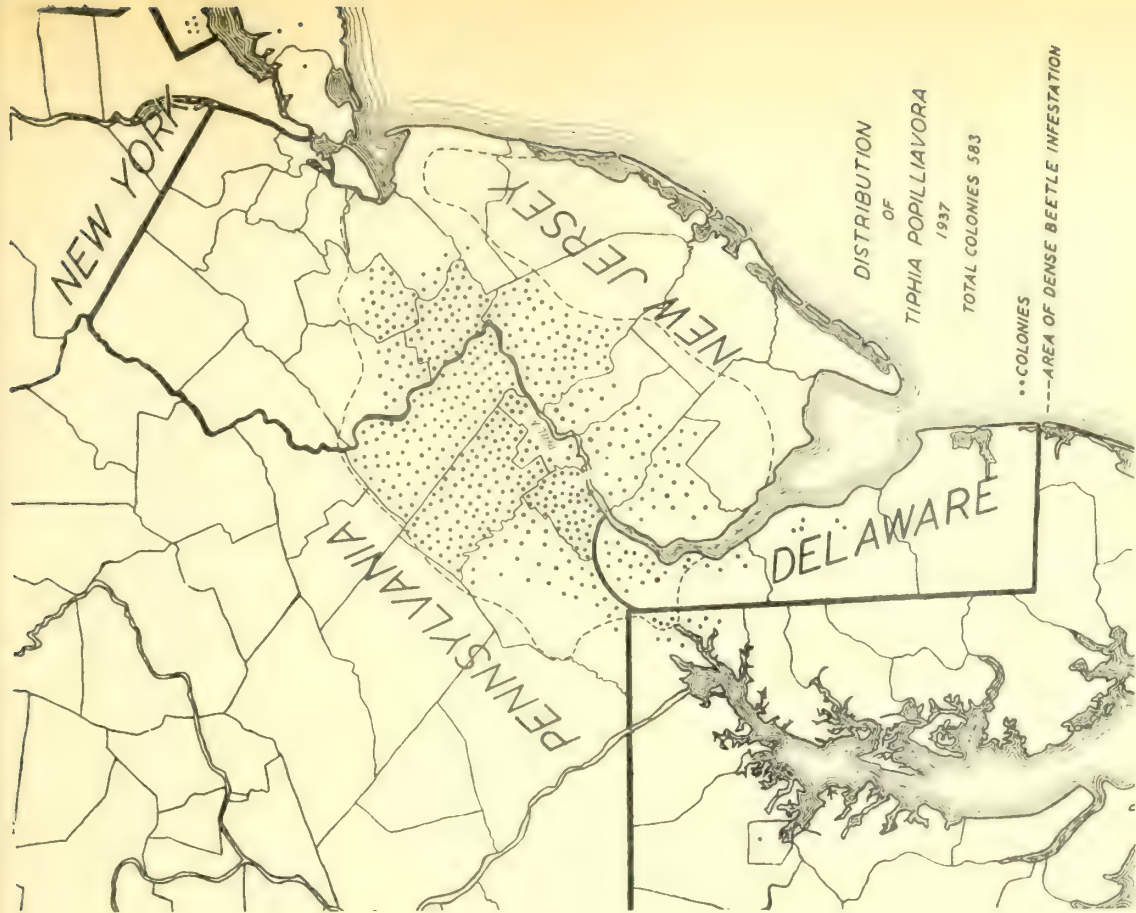
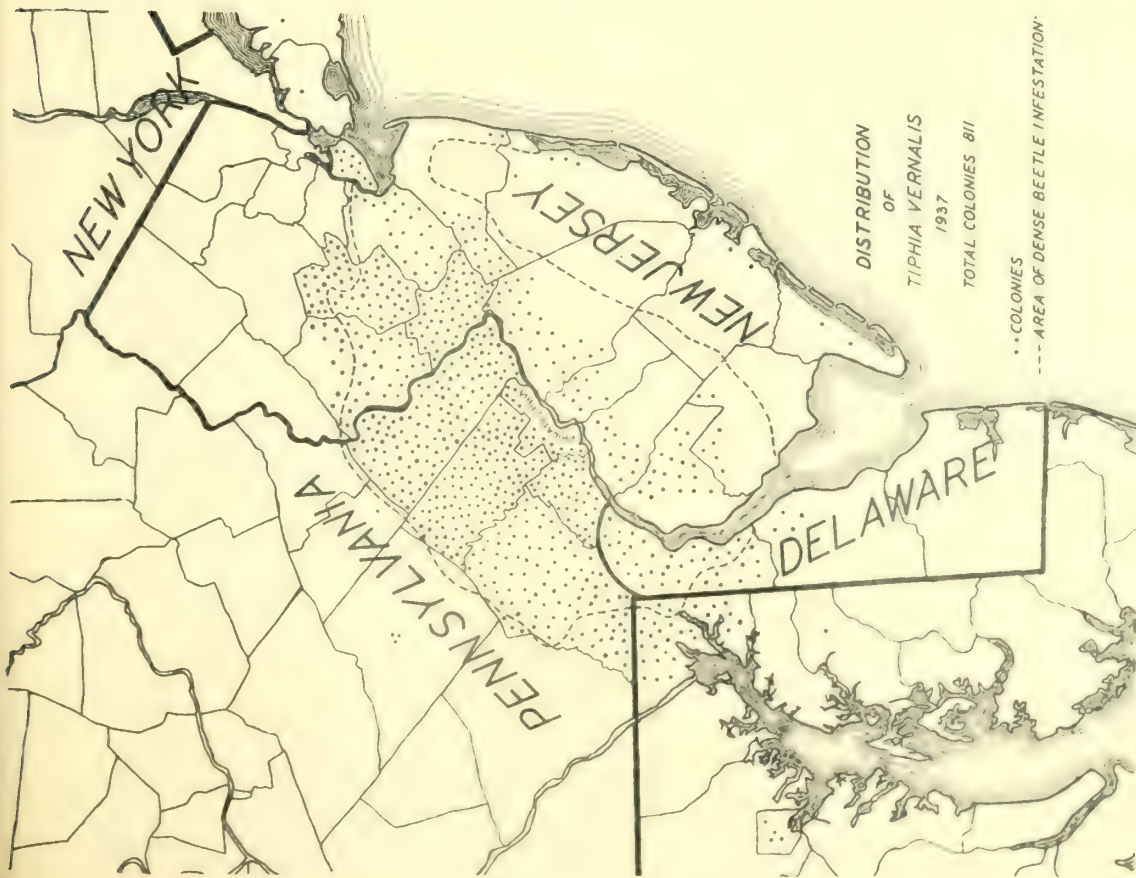


Diagram of the annual colonization of Tiphia popilliavora Roh.
 Each colony consists of 100 or more female Tiphia.



Maps showing in general the distribution of the colonies of *Tiphia vernalis* and *Tiphia popillia vora*.



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INSECT NOTES FROM COSTA RICA IN 1936

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This paper is a continuation of the supplements being published each year in the Insect Pest Survey Bulletin on the collection records made by C. H. Ballou. The previous publications are Supplements to No. 4, Vol. 15, 1935, and Supplement to No. 9, Vol. 15, 1936. The present paper does not include the entire collection records for the year, but only those giving additional data to the preceding lists. The plants are those from which the insects were collected and do not in all instances indicate the food plants. If the insect was feeding, the plant name is followed by "f" and if it was destroying the plant or ruining the crop, by "F".

Although a few localities new to the lists have been added, it is not thought practicable to reissue the map this year.

COLEOPTERA

Insect and locality	Collected on	Date and notes
ANTHICIDAE		
<i>Notorus eximius</i> Champ. Paso Ancho	Cestrum lanatum Cestrum macrophyllum Coix mayuen Ficus carica	Linum usitatissimum Tournefortia foetidissima Trichilia havanensis Watsonia sp.
BRENTIIDAE		
<i>Brentus mexicanus</i> Boh. Paso Ancho Rancho Redondo Waldeck	Cestrum nocturnum Citharexylum caudatum Elaphrium sinaruba	Impatiens balsamina Pennisetum clandestinum "Tora blanca"
EUPRESTIDAE		
<i>Agrilus fuscillatus</i> Chevr. Santa Ana	Buddleia sp.	July
<i>Brachys anthrenoides</i> Wtrh. Paso Ancho	Inga roussoviana	April
<i>Chrysobothris costaricana</i> Obenberger San Pedro	Coffea arabica	December
<i>Chrysobothris convexiusculatus</i> Wtrh. San Rafael de Coronado	Rosa sp.	March
<i>Liopleura nodiery</i> Thery Paso Ancho San Pedro	Cucurbita pepo Eugenia jambos Ficus sp.	September to December
<i>Lius hoscchei</i> Obenberger San Pedro	Vernonia brachiata	April

Insect and locality	C o l l e c t e d o n	Date and notes
Pachyschelus pittieri Fisch. Paso Ancho	Inga roussovia	March, June, November
CANTHARIDAE		
Belotus abdominalis (Lec.) San Pedro	Persea americana	June
Chauliognathus histrio (Dej.)	Aenistus arborescens Citrus limonia	May, June
Chauliognathus oedemeroides Gorh. Paso Ancho San Pedro	Asparagus officinalis Dombeya wallichii Inga roussovia	October to December
Diaphron proteum Gorh.	Citrus limonia Cucurbita pepo Coffea arabica Diphysa robinoides Euphorbia hoffmanniana	July
Discodon plicatum Gorh. Paso Ancho San Pedro	Persea americana Eriobotrya japonica	June, December
CARABIDAE		
Calleida chryseis Bates Paso Ancho San Pedro Tarrazu	Aenistus arborescens Cornutia pyramidata Malpighia glabra Persea americana	May, June, August
Euproctus metricus Bates San Pedro	Persea americana	October
Lebia charilla Bates San Pedro	Persea americana	June

Insect and locality	Collected on	Date and notes
Leptotrachelus puncticollis San Mays Bates San Isidro del General		June
CERAMBYCIDAE		
Adesmus druryi Thoms. Paso Ancho San Pedro	Acnistus arborescens f	October, December
Adesmus spectabilis Bates Paso Ancho	Acnistus arborescens f Eriobotrya japonica	September
Adetus muticus Thomson San Pedro	Spondias purpurea	May
Antodice cretata Bates		June
Compsa textilis Thoms. San Pedro	Persea americana	
Dorcasta geometrica Bates San Pedro	Cnagota edulis	July
Erana leuconoe Bates San Pedro	Ipomoea tiliacea	June
Eucharassus dispar Bates Guadalupe	Erythrina rubrinervia	June
Evander unicolor Bates Santa Elena de Tarrazu	Inga tonduzii	January
Hippopsis lemniscata (F.) Paso Ancho	Coix mayuen Inga roussoviana Vernonia brachiata	May, July, November

Insect and locality	C o l l e c t e d o n	Date and notes
Neoclytus cacicus (Chevr.) Waldeck	Theobroma cacao	April
Nyssodrysina maldemani (Lec.) Waldeck	Theobroma cacao	April
Ochrestes pollinosus (Chevr.) Paso Ancho	Cosmos sulphureus	November. Abundant in flower.
Oncideres trinodatus Csy. Tarrazu	Coffea arabica	September
Ozineus arietinus Bates Waldeck	Theobroma cacao	April, July
Pterichtiya longicauda Bates	Chayota edulis	November, July, September
Pyrodes rhomboderus (Eates) San Isidro del General	Blighia sapida	September June
Trachyderes succinctus L. Paso Ancho	Bidens pilosa	March, November
San Isidro del General	Iycopersicum esculentum	
CHRYSOMELIDAE Allochroa coccineum Clark? Waldeck	Theobroma cacao	July
Allochroa semiaculatum Clark Paso Ancho	Salicium bicolor	May. Injurious
	Colocasia esculenta	f f
	Xanthosoma helleborii- folium	f
	Xanthosoma sagitti- folium	f

Insect and locality	Collected on	Date and notes
Altica jamaicensis Oliv. San Isidro del General San Pedro	Lyrsonina crassifolia Citrus sinensis Jussiaea decurrens f Jussiaea suffruticosa f	Phaseolus vulgaris Polygonum punctatum f
Anomoa sanguinipennis Lacord. San Pedro	Lippia berlandieri Rosa sp.	Zea mays f May. Eating pollen on Zea mays.
Asphaera abdominalis (Chevr.) Paso Ancho	Buddleia davidi f Vernonia brachiata f	April, December
Asphaera nobilitata (F.) Paso Ancho	Chrysophyllum cainito Cecix mayuen Elaeis guineensis	April, November
Calligrapha elegantula Jacoby Paso Ancho Rancho Redondo	Chayota edulis f Curcubita pepo Ipomoea purga f Ipomoea tiliacea	May, July
Calligrapha fulvipes Stål San Pedro Waldeck	Commelina sp.	April, July
Carinispa nevermanni Urmann Paso Ancho	Bunchosia costaricensis f	January, August
Cerotoma rogersi Jacoby San Isidro del General Ujarras	Hamelia erecta Hibiscus sabdariffa f Musa sapientum Panicum barbinode Pennisetum purpureum	Phaseolus helvolus f Solanum tuberosum Vitis vinifera Vitis tiliaceaefolia
Cerotoma ruficornis (Oliv.) San Pedro	Phaseolus vulgaris Zea Mays	May, December

Insect and locality	C o l l e c t e d o n	Date and notes
Chalcophana mutabilis Harold: San Pedro Guadalupe	Pahlia sp. (local name Catalina) Solanaun torvum	
Chalepus clypeatus Baly Waldeck	Panicum barbinode	July
Championaspis interrupta (Champ.) San Pedro	Ipomoea purga f Ipomoea tiliacea f	January, June. Adults emerged January 23.
Chelymorphe gressoria Boh. var. Cartago Tarrazu Waldeck	Calea urticifolia axillaris Coffea arabica Panicum barbinode	July, September
Chirida guttata (Oliv.) San Isidro de Coronado	Ipomoea batatas Ipomoea tiliacea	August, October, December
Colaspis hypochlora Lef. San Pedro Waldeck	"Lirio virginal" Clerodendron cacao	April, July
Colaspis prasina Jacoby San Pedro	Clerodendron fragrans	July
Colaspis submetallica Jacoby	Monstera pertusa	
Colaspoides latesi Jacoby Paso Ancho San Pedro	Hamelia erecta Trichilia hawaiiensis f	February, June, August to December.

Insect and Locality	Collected on	Date and Day
Coptoecyba anachore Boh. San Pedro	Eugenia jambos Sida rhombifolia	Tepicmontana leonensis- flora
Coptoecyba atalanta Boh. Paso Ancho San Pedro	Citronellum cradatum Eugenia jambos Trichilia navenensis f	November to January
Cryptocephalus trimonatus Suffr. Alajuelita San Isidro de Coronado Tarrazu	Alnus acuminata Asclepias curassavica Cestrum aurantiacum Clayota edulis Citrus aurantiifolia f Ipomoea tiliacea Lagerstroemia indica	Morus rubra Psidium molle Ricinus communis f Spondias purpurea Tournefortia foetidissima Viola odorata
Ctenochira aberrata Weise Waldeck	Elaeis guineensis	July
Ctenochira cumulata (Boh.) Cachi Paso Ancho San Vicente de Moravia Torito	Anacardium occidentale Citrus limonia Coffea arabica Cordia alliodora Elaeis guineensis Erythrina rubrinervia Eupatorium odoratum	February, April, June, August, December
Ctenochira rubrocincta (Boh.) Paso Ancho	Inga roussovia	December

Insect, and locality	C o l l e c t e d o n	Date and notes
<i>Ctenochira vivida</i> (Boh.) San Pedro	<i>Annona cherimola</i> <i>Erythrina rubrinervia</i>	<i>Sapium caudatum</i> April, June, December
<i>Dachrys bipartita</i> Jacoby? San Pedro	<i>Rosa</i> sp.	June
<i>Deloyala testudinaria</i> (Boh.) Paso Ancho Santa Ana Waldeck	<i>Cestrum macrophyllum</i> <i>Chayota edulis</i> <i>Malpighia glabra</i> <i>Physalis lagascae</i>	<i>Solanum seaforthianum</i> f <i>Theobroma cacao</i>
<i>Diabrotica balteata</i> Lec. Alajuela Paso Ancho Pavas de Turrialba San Isidro del General	<i>Aleurites moluccana</i> <i>Allium cepa</i> <i>Althaea rosea</i> <i>Amaranthus cruentus</i> <i>Brassica japonica</i> <i>Citrus sinensis</i> <i>Coffea arabica</i> <i>Cucumis sativus</i> <i>Cucurbita pepo</i> <i>Ficus carica</i> <i>Fraxinia chilensis</i>	<i>Gossypium barbadense</i> f Grass <i>Helianthus annuus</i> <i>Impatiens balsamina</i> <i>Ipomoea batatas</i> <i>Portulaca oleracea</i> <i>Rosa</i> spp. <i>Solanum nigrum</i> <i>Triticum aestivum</i> <i>Verbena</i> spp. <i>Vernonia brachiata</i>
<i>Diabrotica corusca</i> Jacoby Tarrara	<i>Coffea arabica</i>	August

Insect and locality	Collected on	Date and notes
Diabrotica fulvicornis Jacq. La Carpintera Paso Ancho San Isidro de Coronado Santa Barbara de Heredia	Annona cherimola Blakea gracilis Canangium odoratum f Conostegia lanceolata Cornutia pyramidata Cucurbita pepo Daucus carota Hamelia erecta	Lycopersicum esculentum Sapium caudatum f Solanum nigrum Solanum tuberosum Tatebuia pentaphylla Terminalia catappa Trichilia havanensis
Diabrotica fulvosignata Baly	Anacardium occidentale Panicum maximum	April
Diabrotica nummularis Harold Alajuela San Isidro de Coronado Santa Ana Tarrazu	Althaea rosea Amaranthus spinosus Borago officinalis f Brassica japonica Brassica rapa Cajanus bicolor Calonyction aculeatum Canna indica Capsicum annum Casuarina equisetifolia Cirsium costaricensis Citrullus vulgaris f Citrus limonia Coix lacryma-jobi f Coix mayuen Coriandrum sativum Cornutia pyramidata Cynara scolymus Cyperus alternifolius	Erythrina glauca Fortunella japonica f Fragaria chilensis Fuchsia sp. Garcinia tinctoria Gossypium barbadense f Grevillea robusta f Helianthus annuus f Hibiscus esculentus Hibiscus sabdariffa f Hibiscus scizopetalus Holcus sorghum Indigofera suffruticosa Ipomoea purga f Iresine herbsti Jacaranda ovalifolia Jacobinia coccinea Linum usitatissimum f Loniceria japonica

Insect and locality	Collection	Date and notes
Diabrotica undecimnotata-- Cont'd.	<i>Heliconia radiata</i> f <i>Mangifera indica</i> f <i>Nicotiana glauca</i> f <i>Passiflora ligularis</i> f <i>Pennisetum purpureum</i> f <i>Pennisetum polystachyon</i> f <i>Petroselinum hortense</i> f <i>Phaseolus helvolus</i> f <i>Phytolacca octandra</i> f <i>Plantain</i> f <i>Rubus</i> spp. (Blackberry) f	<i>Salix chilensis</i> f <i>Salvia splendens</i> f <i>Sambucus mexicana</i> f <i>Sapium carolinianum</i> f <i>Solanum lanceolatum sinu-</i> <i>atum</i> f <i>Spondias purpurea</i> f <i>Tephrosia toxicaria</i> f <i>Trema micrantha</i> f <i>Triticum aestivum</i> f <i>Valerianoides cayanense</i> f <i>Vernonia brachiata</i> f <i>Vitis rotundifolia</i> f <i>Vitis tiliacifolia</i> f <i>Zantedeschia aethiopica</i> f
Diabrotica porracea Harold Orosi Paso Ancho San Isidro de Coronado Santa Ana Santa Barbara de Heredia	<i>Eragrostis officinalis</i> f <i>Coix maynensis</i> f <i>Cyperus latifolius</i> f <i>Cyperus pectinatus</i> f <i>Cyperus pedunculatus</i> f <i>Cyperus tenuifolius</i> f	<i>Hibiscus rosa-sinensis</i> f <i>Holcus sorghum</i> f <i>Lingum pectinatum</i> f <i>Persea indica</i> f <i>Zinnia elegans</i> f
Diabrotica theimelii Ealy Paso Ancho	<i>Cirsium costaricensis</i> f <i>Citrullus vulgaris</i> f <i>Cucurbita pepo</i> f	<i>Diplazis robinoides</i> f <i>Impatiens balsamina</i> f <i>Sparganium angustifolium</i> f
Diabrotica variabilis Jacoby Paso Ancho San Pedro	<i>Passiflora ligularis</i> f <i>Pennisetum polystachyon</i> f <i>Phaseolus vulgaris</i> f <i>Phytolacca octandra</i> f <i>Heliconia</i> sp. f	<i>Passiflora ligularis</i> f <i>Pennisetum polystachyon</i> f <i>Phaseolus vulgaris</i> f <i>Phytolacca purpurea</i> f <i>Zea mays</i> f

Insect and locality	Collector	Date and notes
<i>Diabrotica vittata</i> (F.) Grosi Paso Ancho Santa Ana	<i>Agave persica</i> <i>Brassica japonica</i> <i>Cajanus bicolor</i> <i>Citrus paradisi</i> <i>Colix mayague</i> <i>Dahlia rosea</i> <i>Molcus sorghum</i>	Throughout the year.
<i>Diabrotica vittata</i> (F.) Paso Ancho	<i>Citrullus vulgaris</i> <i>Marsifera indica</i>	Throughout the year.
<i>Diphaulaca nitida</i> Jacoby Cachi La Carpintera San Pedro	<i>Cestrum aurantiacum</i> <i>Sapium caudatum</i> f	January, February
<i>Disonycha austriaca</i> (Schauf.) var. Waldeck	<i>Achyranthes aspera</i>	July
<i>Disonycha collata</i> (F.) Waldeck	<i>Amaranthus cruentus</i> f	April, July
<i>Disonycha figurata</i> Jacoby Alajuelita	<i>Crotalaria striata</i> f	January
<i>Disonycha chaglabrata</i> (F.) San Pedro	<i>Amaranthus cruentus</i>	June, July
<i>Disonycha recticollis</i> Jacoby? San Pedro	<i>Citrus limonia</i> <i>Lycopersicum esculentum</i> f <i>Polygonum punctatum</i> f	April, May, July to September.
	<i>Ipomoea latatas</i> <i>Ipomoea purpa</i> <i>Prunus salicina</i> <i>Psidium cattleianum</i> <i>Solanum tuberosum</i> <i>Tripsacum laxum</i>	
	<i>Passiflora ligularis</i>	
	<i>Sida rhombifolia</i>	
	<i>Panicum barbinode</i>	
	<i>Prunus salicina</i>	

Insect and locality	C o l l e c t e d o n	Date and notes
Dolichotoma bisbiplagiata Bol. Waldeck	Cornutia pyramidata	April, June, July
Doryphora spectanda Stål Santa Ana	"Huesillo"	July
Epitrix fuscata (Duv.) San Isidro de Coronado Santa Ana	Amaranthus cruentus Apium graveolens Celosia cristata Cucurbita pepo Ficus carica Fragaria chiloensis	Throughout the year. f
Galeruca encaustica Germ. Alajuela Tarrazu Waldeck	Cestrum macrophyllum Coffea arabica Theobroma cacao	July, August
Galerucella lineatipennis Jacoby San Pedro	Cornutia pyramidata Croton gossypifolium	March, June, November to January. f
Griburius panamensis (Jacoby) Guadalupe	Solanum torvum	May
Homopnoeta albofasciata Jacoby San Pedro	Solanum tuberosum	March

Insect and locality	Collection	Date and notes
Homophoea cyathipennis octo- maculata (Grosven) San Isidro del General Waldock	Alburites moluccana Eligbia sapida Citharexylum caudatum Citrus limetta Coix mayuen Cytisus fragrans Helianthus annuus Hibiscus sabdariffa Linum usitatissimum Lucuma mammosa Manihot esculenta	Melinis minutiflora Nicotiana glauca Panicum bartinode Paspalum fasciculatum Passiflora ligularis Persea pittieri Portulaca oleracea Sesamum orientale Solanum tuberosum Triticum aestivum Vitis tiliacifolia
Lema chiriquensis Jacoby San Pedro	Cnayota edulis Ipomoea tiliacea Malacra radiata	July, August, November
Lema dorsalis Oliv. Pavas de Turrialba San Pedro	Grass Ipomoea purga	January, February
Lema foveipennis Jacoby? San Pedro	Rumex crispus	January
Lema sallaei Jacoby Pavas de Turrialba San Pedro	Grass Ipomoea purga	January, February
Leptinotarsa undecimlineata (Stål) La Carpintera San Isidro de Coronado		

Insect and locality	Collected on	Date and notes
Malacorhinus decempunctatus Jacoby Paso Ancho	Annona cherimola Colocasia esculenta Inga leptolaba	f Inga roussovia Malpighia glabra August, October to December. Usually found between leaves webbed together by other insects.
Metriona crucepennis (Boh.) San Pedro	Cestrum aurantiacum	f Meibomia sp. Abundant. July.
Metriona emarginata (Boh.)	Ipomoea purga Ipomoea tiliacea	f Vernonia brachiata July
Metriona zona (F.)	Elaeis guineensis	April
Nodonota irazuensis (Jacoby) Orosi San Isidro de Coronado San Isidro del General Santa Ana Tarrazu	Aleurites moluccana Althaea rosea Amaranthus spinosus Antigonon leptopus Apium annu Bauhinia violacea Beta vulgaris cicla Blighia sapida Brassica japonica Cajanus bicolor Calonyction aculeatum	f Throughout the year. Causes serious injury. f Cassia alata Cassia reticulata Celosia cristata Cestrum macrophyllum Citrus nobilis x C. para- disi Codiaeum variegatum Coix mayuen Coriandrum sativum Cosmos sulphureus Dahlia sp. (Catalina) f f f

[illegible]

Insect and locality	C o l l e c t e d o n	Date and notes
<i>Modonota lateralis</i> (Jacoby) Cartago Paso Ancho San Isidro de Coronado San Isidro del General Santa Ana	<i>Acacia costaricensis</i> f <i>Acacia farnesiana</i> f <i>Amaranthus cruentus</i> <i>Amygdalus persica</i> <i>Anethum graveolens</i> <i>Annona cherimola</i> f <i>Annona squamosa</i> <i>Antigonon leptopus</i> <i>Asclepias curassavica</i> <i>Bidens pilosa</i> <i>Bombacopsis fendleri</i> <i>Borago officinalis</i> f <i>Bryophyllum pinnatum</i> <i>Buddleia davidi</i> <i>Ersonima crassifolia</i> <i>Cajanus bicolor</i> f <i>Capsicum annum</i> <i>Casimiroa edulis</i> f <i>Cassia alata</i> <i>Cassia reticulata</i> <i>Cassia spectabilis</i> <i>Chayota edulis</i> <i>Citrus aurantium</i> <i>Clerodendron fragrans</i> <i>Coix lacryma-jobi</i> <i>Coix mayuen</i> <i>Coriandrum sativum</i> f <i>Cosmos sulphureus</i> f <i>Cucurbita pepo</i> <i>Fortunella japonica</i> <i>Erythrina rubrinervia</i> f <i>Garcinia tinctoria</i> <i>Gardenia jasminoides</i>	<i>Gomphrena globosa</i> f <i>Gossypium barbadense</i> f <i>Hibiscus esculentus</i> <i>Hibiscus rosa-sinensis</i> <i>Hibiscus sabdariffa</i> <i>Holcus sorghum</i> <i>Impatiens balsamina</i> f <i>Inga roussovia</i> <i>Ipomoea batatas</i> <i>Lactuca sativa</i> <i>Lantana camara</i> f <i>Linum usitatissimum</i> f <i>Malanthera aspera</i> <i>Morus rubra</i> <i>Nicotiana tabacum</i> <i>Ocimum basilicum</i> f <i>Phaseolus helvolus</i> <i>Philadelphus trichapetalus</i> <i>Phytolacca octandra</i> <i>Polyanthes tuberosa</i> f <i>Punica granatum</i> f <i>Rosa spp.</i> F <i>Rubus sp. (Flackberry)</i> f <i>Scabiosa atropurpurea</i> f <i>Salvia splendens</i> f <i>Sambucus mexicana</i> <i>Solanum tuberosum</i> <i>Solanum wendlandi</i> f <i>Tagetes erecta</i> f <i>Tournefortia foetidissima</i> <i>Triumfetta josefina</i> <i>Vernonia brachiata</i>
<i>Nuxtonia isthmica</i> Champ. Waldeck	<i>Theobroma cacao</i>	April, July

Ingeniería Agrícola		Collection		Date and notes	
Cedronychia clavigera Jacq.	San Pedro	Cedronychia clavigera	f	Tubatia pentaphylla	June, August
		Passiflora erecta			April
Cedronychia laevigata Jacq.	Paso Ancho	Cedronychia laevigata			April, July.
					Abundant.
Cedronychia richiei Karst.	Wardick	Cedronychia richiei			November
Cedronychia tenuicincta Jacq.	Santa Barbara	Cedronychia tenuicincta			
Pachyrhynchus femoratus (Oliv.)	Paso Ancho	Pachyrhynchus femoratus			
Plagioderma bis-tripunctata Duvivier?	San Pedro	Plagioderma bis-tripunctata			June
Plagioderma congesta Stål?	Paso Ancho	Plagioderma congesta			March to November
Pseudomesomphalia isthmica (Champ.)	San Pedro	Pseudomesomphalia isthmica			January, June to November
Pseudomesomphalia pictilis (Boh.)	San Pedro	Pseudomesomphalia pictilis			July, October

Insect and locality	Collected on	Date and notes
Rhabdopterus jansoni Jacoby Alajuela	Coffea arabica	May
Sangaria haegi Harold? San Pedro	Annona cherimola	June
Systema s-littera (L.) Chiz Pavas de Turrialba San Pedro Waldeck	Achyranthes aspera Panicum barbinode Panicum maximum Paspalum fasciculatum Solanum tuberosum	February, May, July
Systema ustulata Harold Chiz Pavas de Turrialba Turrialba	Panicum maximum Vernonia brachiata	February. Abundant.
Uroplata aterrima Guer? La Carpintera San Pedro	Vernonia brachiata	February, April, October
Xenochalepus amplipennis (Baly) Paso Ancho San Pedro	Erythrina rubrinervia	January, November
Xenochalepus omogerus (Grotch) San Jose San Isidro de Coronado San Pedro	Canavalia ensiformis Coffea arabica Phaseolus lunatus	January, August, December
Xenochalepus waterhousei (Baly) San Pedro	Erythrina rubrinervia	July

Number and Locality	Collector	Species	Month
11111 Ficus latifasciatus (Hb.) Faso Ancho San Pedro	Eriocarya japonica Eugenia jambos	Persea americana	June, December
1111111111 Cycloneda pallidula (Hb.) Tarrana	Coriaria arapica		August
Cycloneda sallaei (Hb.) San Pedro	Persea americana		September
Epilachna defecta Hb.	Chayote edulis Citrus aurantium Gibiscus rosa-sinensis	Solanum lanceolatum sin- tuan	July
Epilachna vincta Crotch Vuelta de Jorco	Eugenia jambos	Trichilia havanensis	April, August
Epilachna virgata Hb.			January, May
Seymus horri Gorb. Faso Ancho San Pedro			Predacious on Aphid Gossypii Glov. and A. nerii Boyer.
CUCUJIDAE Telephanus grossicornis Nevermann	Saccharum officinarum		August
Santa Barbara de Heredia			
Telephanus melanchlorus Nevermann San Pedro	Sapium caudatum		September

Insect and locality	Collected on	Date and notes
LASCYLLIDAE		
<i>Ptilodactyla maculata</i> Champ.? Waldeck	<i>Theobroma cacao</i>	April
DERMESTIDAE		
<i>Cryptorhopalum balteatum</i> Lec.? San Pedro	<i>Chrysanthemum maximum</i> f <i>Dombeya wallichii</i>	January, December. Feeds on pollen.
<i>Cryptorhopalum triste</i> Lec.? Paso Ancho	<i>Chrysanthemum maximum</i> f <i>Guiljelma utilis</i>	December, January. Feeds on pollen.
ELATERIDAE		
<i>Aeolus facetus</i> Canad. Waldeck	<i>Theobroma cacao</i>	April
<i>Aptopus chiriquensis</i> Champ. Santa Barbara de Heredia	<i>Zea mays</i>	August
<i>Glyphonyx quadraticollis</i> Champ. San Pedro	<i>Persea americana</i>	June
<i>Semiotus superbus</i> Kirsch. La Carpintera	<i>Lantana trifolia</i>	February
ENDOMYCHIDAE		
<i>Stenotarsus flavago</i> Gorh. Tarraru	<i>Coffea arabica</i>	September
EROTYLIDAE		
<i>Homoeotelus jansoni</i> Crotch	<i>Cestrum lanatum</i>	December
<i>Mycotretus luteipes</i> Lacord.	<i>Cestrum macrophyllum</i>	April
<i>Zonarius jansoni</i> Crotch Waldeck	<i>Theobroma cacao</i>	July
	<i>Hibiscus rosa-sinensis</i>	

Index and Locality

Collection

See page 103

MISTLETOES

Hololepta garibayana (F.) Speg. & Walp.
San Pedro

July

LABRILLAE

Statira triangularis Champ.
Santa Barbara de Perote

See page 103

August

Statira tropicalis Champ.
Waldeck

Theobroma cacao

July

LAMPYRIDAE

Aspidosoma aegrotum Gornh.
San Pedro

Sambucus mexicana

June

Aspidosoma laterale (F.)
San Pedro

Cissus sicyoides
Croton gossypifolium

Fennisetum purpureum

August

Hyas bipunctatus Gornh.
Santa Ana

Guazuma ulmifolia

July

Lucidota bella Gornh?
Waldeck

Inga sp.

Theobroma cacao

April

Lucio castelnaui Kirsch.
Waldeck

Elaeis guineensis

Passiflora sp.

April

Photinus volcanicus Gornh?
Waldeck

Theobroma cacao

April

Insect and locality	C o l l e c t e d o n	Date and notes
LANGURIIDAE. <i>Teretilianguria metallica</i> Gorn. Waldéck	<i>Urera baccifera</i>	July
LYCIDAE <i>Caenia cardinalis</i> Gorn. Paso Ancho	<i>Rosa</i> sp. f	December
<i>Calopteron bifasciatum</i> Gorn. San Isidro del General	<i>Annona muricata</i> <i>Conostegia lanceolata</i>	June, November
<i>Calopteron cyaneum</i> Erichs. Paso Ancho	<i>Picus communis</i>	October
<i>Calopteron obliquum</i> (Say) San Pedro	<i>Passiflora quadrangularis</i> f	May
<i>Calopteron papale</i> Kirsch. San Isidro del General	<i>Zea mays</i>	June
<i>Calopteron pennatum</i> Bourgeois San Pedro	<i>Carangium odoratum</i>	November, December
<i>Calopteron reticulatum</i> (F.) Paso Ancho San Isidro del General San Pedro Santa Ana	<i>Bixa orellana</i> <i>Cestrum lanatum</i> <i>Coix lacryma-jobi</i> <i>Coix mayuen</i> <i>Citharexylum caudatum</i> <i>Ocotea gossypifolium</i> f <i>Cucurbita pepo</i> <i>Elephantium simaruba</i>	June to August, October, December. Abundant

Plant and Locality	Collector and Date	Notes
<i>Calliandra grandiflora</i> Gork. San Pedro	Rosa spp.	January
<i>Platanus grandis</i> Gork.	<i>Spondias purpurea</i>	July
<i>Platanus grandis</i> Gork. San Pedro Tarrasa	<i>Citrus sinensis</i> <i>Coffea arabica</i> <i>Hamelia erecta</i> <i>Inga tonkinensis</i>	January, April to June, August, September
MELASTOMATACEAE <i>Attalea acuminata</i> Gork.? Paso Ancho San Pedro	<i>Inga roussoi</i>	April, November
MELASTOMATACEAE <i>Deltometorus foveolatus</i> Guer. Paso Ancho	<i>Cecimiroa edulis</i>	May
MELASTOMATACEAE <i>Epicaea grammica</i> (Fisch.) San Pedro	<i>Canna indica</i>	November
MELASTOMATACEAE <i>Listrus canescens</i> Kern. Paso Ancho San Pedro	<i>Calliandra grandiflora</i> <i>Calistephus chinensis</i> <i>Calonyction aculeatum</i> <i>Chenopodium ambrosioides</i> <i>Curatanthemum maximum</i> F <i>Coreopsis lanceolata</i> <i>Cosmos sulphureus</i> <i>Dahlia rosea</i> <i>Demba wallichii</i>	January, July, November, December. Adult injures flower by eating pollen.
<i>Gerbera jamesonii</i> <i>Impatiens balsamina</i> <i>Iris laevigata</i> <i>Lonicera japonica</i> <i>Phaseolus vulgaris</i> <i>Phytolacca octandra</i> <i>Rosa</i> spp. <i>Sambucus mexicana</i> <i>Tagetes patula</i>		

Local name	Collected on	Remarks
Zulia (Venezuela) San Carlos Zulia (Venezuela) San Carlos Zulia (Venezuela) San Carlos	Leistia eriophora Citrus limonia Citrus sinensis Zulia nora Lycopersicon es. Hibiscus rosa-sinensis Impatiens balsamina	Ipomoea sp. Lonicera japonica Musa sapientum Polygonum punctatum Vernonia brachiata Zea mays
Gymnetis littorata (Oliv.) Paso Ancho San Isidro del General	Ames setivus Musa sapientum Pellium guajava	Scaevola purpurea Trichilia nayanensis
Gymnetis stellata (Lam.) Grecia	Citrus nobilis	November. Adult drinking sap at wound in bark.
Hippia argyritis Bates	Vernonia brachiata	f
Hippia surata Bates	Persea americana	f
Macraspis lucida (Oliv.) San Isidro del General	Citrus sinensis Anacardium occidentale	f f
Macrodactylus lineatus Chev. Paso Ancho San Pedro	Erysonima crassifolia Citrus limonia Hymenaea couroupil	f f
	Impatiens balsamina Polygonum punctatum	June May. Abundant on flowers of C. si- nensis and on fruit of A. occidentale.

Insect and Locality	Collected on	Date and Notes
<i>Macroctylus curvis</i> Bates Alajuela	<i>Citrus nobilis</i> x <i>C. paradisi</i> <i>Coffea arabica</i> <i>Fortunella japonica</i> <i>Heliotropium peruvianum</i>	<i>Hicoria pecan</i> f <i>Persea americana</i> f <i>Spondias purpurea</i> <i>Vernonia brachiata</i>
<i>Macroctylus cylindricus</i> Bates	<i>Citrus limonia</i> <i>Citrus nobilis</i> x <i>C. paradisi</i>	<i>Fortunella japonica</i> <i>Vernonia brachiata</i>
<i>Onthophagus marginicollis</i> Harold Santa Ana	<i>Verbesina turbacensis</i>	July
<i>Pachystethus marginata</i> (F.) Rancho Belenito	<i>Zantedeschia aethiopica</i>	July March
<i>Pachystethus nitidula</i> (Blanch.) Rancho Belenito	<i>Calcection aculeatum</i> f <i>Paricum barbinole</i>	March. Feeding in flower of <i>C. aculeatum</i> .
<i>Pellinota castaricensis</i> Bates Paso Ache San Peiro	<i>Asparagus plumosus</i> <i>Nicotiana tabacum</i>	May, June
<i>Pellinota striposa</i> Castelnau Santa Ana	<i>Triesacum laxum</i>	September
<i>Strisoderma rutelina</i> Bates	<i>Asparagus plumosus</i>	
SIAPHILINIDAE		
<i>Xanthorhagus colvayi</i> Sharp Paso Ache San Peiro		August, September. Eating <i>Molnola irazensis</i> and <i>Diabrotica nummularis</i> .

Insect and locality	Collector	Date and notes
Gasterocercus - Campylopus - Camp. - San Pedro - Camp.	Imatitia balsamita f	Feeding at leaf stomach.
THEE BULLIAR Gasterocercus - Camp. - San Pedro	Imatitia balsamita	July
Ellaenrenatus forensellus Champ. San Pedro	Coffea arabica	May. In bark wall.
Epitetracercus volucri (Champ.) Alajuelita	Vernonia bracteolata	January
Gasterocercus cornutus (F.) Palmares del General	Storea tobacco seed f	March
Hegemona costaricensis Champ. San Pedro	Sporolobus indicus	December
Lobometopon atemelensis (Champ.) Alajuelita San Isidro de Coronado Santa Barbara de Heredia	Annona squamosa Brassica japonica Byrsonima crassifolia Callianira grandiflora Chrysanthemum maximum	Throughout the year. Eats pollen and rust fungus on wheat and on I. roussoviaana.
Schoenicus paramensis Champ. Alajuelita	Crotalaria striata Poinsettia pulcherrima Psidium guajava	November. Feeding at nectary of flower of P. pulcherrima.
Strongylium permodicum Maklin? Alajuela	Inga sp. Crera baccifera	May, July

Insect and locality	Collector	Date and notes
Zophelus costaricensis Chevrol. Terruzzi	Coffee arabica	August. Common and well-known insect.
THEOSCIDAE		
Drepanes tremulatus Horn San Pedro	Cestrum aurantiacum	Injunctus balsaminus
Lissonota innotata Horn San Isidro del General	Citrus sinensis	June
RHYNCHOPHORA		
Acronotus directus (Say) San Jose	Stenotaphrum	August
Acronotus pallidus Bon.	Pyrus communis	July, October
Acronotus humilis Chevrol. Malaga	Theobroma cacao	April
Atelabus laevicollis Gril. Guatemala San Pedro	Cordia alliodora	July, November
Cestrinus trivittatus Chevrol. Paso Acazo San Pedro	Cestrum aurantiacum Injunctus balsaminus	July, June
Cleistoloma similis (Chevr.) Paso Acazo Ujarras	Cassia sophora Daniella rosea Gynandrium sagittatum	January, October
Conotrachelus fulvescens Camp.	Cornutia pyramidalis	December

Local Name	Collector	Date collected
<i>Coccoloba</i> <i>serena</i> Barrie San Pedro	Peru communis	f
<i>Centropogon</i> <i>rectirostris</i> C. H. B. Paso Ancho	Inga paterno	f
<i>Coccoloba</i> <i>rufoellii</i> Camp. W. Waldeck	Theobroma cacao	April
<i>Cosmopolites</i> <i>serotinus</i> (Germ.) Paciño San Carlos	Cissus sicyoides	October
<i>Eurhinus</i> <i>festivus</i> (F.) Paso Ancho	Citrus nobilis	April
<i>Exochanthus</i> <i>lexellianus</i> (White)	Celosia argentea Cnagota edulis Cissampelos caudata Coix mayuen Crotalaria fulva Erythrina rubrinervia Gomphrena globosa	Theobroma cacao Rosa spp. Solanum tuberosum Tagetes erecta Theobroma cacao Tournefortia foetidissima Vernonia brachiata
<i>Geraeus</i> <i>lentiginosus</i> (Bon.) Paso Ancho San Pedro Turrialba Waldeck	Anatropegon bicornis Coix lachryosa-jobi Inga roussoviaiana Myosotis sylvatica	May. In flowers.
<i>Geraeus</i> <i>lineellus</i> (Lec.) Paso Ancho Waldeck Ujaras	Anatropegon bicornis Coix lachryosa-jobi Inga roussoviaiana Myosotis sylvatica	July to September, December
<i>Geraeus</i> <i>senilis</i> Gyll. Santa Ana	Anatropegon bicornis Coix lachryosa-jobi Inga roussoviaiana Myosotis sylvatica	f

Insect and locality	Collected on	Date and notes
Hemiphaedusa pittieri Fleck. Guadalupe	Persea americana f	March, September. Eats holes in leaves.
Hemiphaedusa trifasciatus F. San Pedro	Citrus sinensis	
Hemiphaedusa varipes Chapm. San Pedro	Xanthoxylum sp. f	August
Lechriophaedusa curvatus Bond. Paso Ancho San Pedro	Doryalis hebecarpa	January, June.
Lepidophaedusa aculeata Chapm. Paso Ancho	Acanthophaedusa arborescens	August
Lixus apterus Chapm. La Cominteria	"Purca"	February
Metamasius sericeus (Oliv.) Alamela Guadalupe Paso Ancho	Cocos nucifera Larva variegatissima f	January, May, October. Eats into midribs of plantain.
Metamasius submaculatus Chapm. Paso Ancho	Larva paradisica	May
Microgaster lineicollis Bond. Paso Ancho Tarralbo	Impatiens balsamina Impatiens suffruticosa Iris laevigata Leonurus sibiricus Myosotis sylvatica	January, February, May, August. f/

Number	Scientific Name	Local Name	Collector	Date	Remarks
1	<i>Stemodia</i>	Stemodia	San Pedro	May, June	Planted in fruit.
2	<i>Stemodia</i>	Stemodia	San Pedro	May, June	Planted in fruit.
3	<i>Stemodia</i>	Stemodia	San Pedro	May, June	Planted in fruit.
4	<i>Stemodia</i>	Stemodia	San Pedro	May, June	Planted in fruit.
5	<i>Stemodia</i>	Stemodia	San Pedro	May, June	Planted in fruit.
6	<i>Stemodia</i>	Stemodia	San Pedro	May, June	Planted in fruit.
7	<i>Stemodia</i>	Stemodia	San Pedro	May, June	Planted in fruit.
8	<i>Stemodia</i>	Stemodia	San Pedro	May, June	Planted in fruit.
9	<i>Stemodia</i>	Stemodia	San Pedro	May, June	Planted in fruit.
10	<i>Stemodia</i>	Stemodia	San Pedro	May, June	Planted in fruit.

HEMIPTERA

Insect and locality	Collected on	Date and notes
ANTHOCORIDAE		
<i>Triphleps tristicolor</i> White San Pedro	<i>Amaranthus spinosus</i>	April, December
COREIDAE		
<i>Acanthocephala declivis</i> Guatemalena Dist. Paso Ancho	<i>Citrus aurantiifolia</i> <i>Citrus medica</i> <i>Citrus paradisi</i>	<i>Ficus carica</i> <i>Persea americana</i>
<i>Acanthocephala luctuosa</i> (Stål) San Pedro	<i>Vernonia brachiata</i>	
<i>Anasa bellator</i> (F.) San Pedro	<i>Polakowskia tacaco</i>	June
<i>Anasa litigiosa</i> Stål Ujaras	<i>Lantana camara</i>	February
<i>Anasa madida</i> Dist. San Pedro	<i>Annona muricata</i> <i>Passiflora quadrangularis</i>	August, October
<i>Anisocelis gradada</i> Dist.	<i>Erythrina rubrinervia</i> <i>Passiflora ligularis</i>	January, July, August
<i>Archimorus scutellaris</i> (Stål)	<i>Claytonia edulis</i>	October
<i>Eurymus notatipennis</i> (Stål) San Isidro del General San Pedro Tarrazu	<i>Eugenia unillora</i> <i>Ipococa parga</i> <i>Vernonia graciliata</i> <i>Coffea arabica</i>	January, March, July, August

Locality	Collected at	Date
Corizus punctata Dallas San Pedro	Cucurbita pepo	February
Cetrenis modesta Dist.	Impatiens balsamina	January
Coreocoris fuscus (Tunt.) Guadalupe San Pedro	Brassica japonica Fragaria chiloensis Ipomoea tiliacea f	April, May, June, August, October
Coreocoris granulatus (Stål) San Pedro	Passiflora ligularis	September
Corizus bohemanii Sign. San Pedro	Polygonum punctatum	May
Corizus lateralis (Say) San Pedro	Hibiscus rosa-sinensis	June
Corizus sidae (F.) Guadalupe Paso Ancho Ujarras San Isidro del General	Erythrina rubrinervia Grevillea robusta Hibiscus rosa-sinensis Inga roussoviensis Meibomia spp.	February, April, May
Hamostes affinis Dallas Paso Ancho San Pedro	Asparagus officinalis f Colix mayuen	October
Evalymenus tarsatus (F.) Ujarras Waldeck	Citrus limonia Meibomia sp. Paspalum fasciculatum	February, April, July

Insecta Dallas	Dallas	Dallas	Dallas
<i>Alloporus cinctus</i> (Dallas) Paso Ancho San Isidro del General	<i>Chorizanthe ligulicollis</i> <i>Cyperus alternifolius</i> <i>Cynodon dactylon</i>	<i>Alloporus cinctus</i> <i>Psidium guajava</i> <i>Zea mays</i>	April, July
<i>Neotoma lepida</i> Stål Waldeck	<i>Zebrina maculata</i> <i>Elaeis guineensis</i>	<i>Inga</i> sp. <i>Panicum bartinodes</i>	May
<i>Pachys leucor Stål</i> San Isidro del General	<i>Inga edulis</i>	I	March
<i>Pachys leucor</i> (F.)	<i>Chagota edulis</i>	I	February, May, June, March, November
<i>Eurysa dicta</i> (Erury) San Isidro del General San Pedro	<i>Amorpha chinensis</i> <i>Inga edulis</i> <i>Lycopersicon esculentum</i>	<i>Solanum nigrum</i> <i>Solanum tuberosum</i> <i>Zea mays</i>	March, July, August
<i>Stalatus marginalis</i> Burm. Paso Ancho	<i>Cajanus bicolor</i> <i>Chagota edulis</i> <i>Citrus nobilis</i> x C. <i>paradisi</i>	<i>Mitiscus sabdariffa</i> <i>Solanum tuberosum</i>	April, July
<i>Zicca commaculata</i> List. Waldeck	<i>Anarthus spinosus</i> <i>Panicum maximum</i>	<i>Panicum maximum</i> <i>Polygonum punctatum</i> <i>Psidium guajava</i> <i>Solanum tuberosum</i>	March, May, June, November
<i>Zicca taeniola</i> (Dallas) San Isidro del General Waldeck	<i>Coix lacryma-jobi</i> <i>Coix mayuen</i> <i>Ipomoea purga</i> <i>Lantana trifolia</i> <i>Malacra radiata</i>	<i>Panicum maximum</i> <i>Polygonum punctatum</i> <i>Psidium guajava</i> <i>Solanum tuberosum</i>	May, August

CYDNIIDAE

Alloporus elegans McA. & M.
San Pedro

Insect and locality	Collected on	Date and notes
<i>Pangaeus piceatus</i> Stål Paso Ancho San Isidro del General San José	<i>Cucurbita pepo</i> <i>Nicotiana glauca</i> <i>Rhus rhaponticum</i>	February, May
<i>Thyreocoris guttiger</i> Stål San Isidro del General Santa Ana	<i>Amaranthus cruentus</i> Zea mays	March, July
LYGAEIDAE <i>Acroleucus brevicollis</i> (Stål) Paso Ancho	<i>Acinetia arborescens</i> <i>Citrus limonia</i>	September, October, November.
<i>Acroleucus tullus</i> (Stål) San Pedro	<i>Impatiens balsamina</i>	January, June
<i>Epipolus calus-ceneri</i> Deg. Alajuelita	<i>Psidium guajava</i>	January
<i>Geocoris pallens</i> Stål Paso Ancho	<i>Inga roussoi</i>	April
<i>Ligyrocoris litigiosus</i> (Stål) San Isidro del General	Zea mays	February
<i>Ligyrocoris multispinus</i> Stål San Isidro de Coronado San Pedro	<i>Brassica japonica</i> <i>Sida rhombifolia</i>	July, December

Insect and locality	Collection	Date and host
<i>Lygaeus distinctus</i> Harris Say La Cumbre Faso Ancho San Isidro del General	Dian. argentea Crataegia sp. Ipomoea bilobata Persea caribaea	February, March, October
<i>Lygaeus fulvipes</i> Fitch. Alajuela San Pedro	Cecropia indica Citrus sinensis	March, November
<i>Lygaeus pallido-cinctus</i> Stål San Pedro	Jacaranda ovalifolia	January
<i>Lygaeus reclinatus</i> Say San Pedro	Amaranthus cruentus Rosa spp.	February, July
<i>Lygaeus shleri</i> Stål	Citrus sinensis	June, October
<i>Nysius californicus</i> Stål	Amygdalus davidiana Annona cherimola Carissa grandiflora Persea pittieri	March, April, June
<i>Oncopeltus cingulifer</i> Stål	Annona cherimola Citrus aurantifolia f	December
<i>Oncopeltus fasciatus</i> (Dallas) Faso Ancho	Calyptranthes costaricensis	July

Insect and locality	C o l l e c t e d o n	Date and notes
Orthocera pilobata (Say) San Rafael de Coronado Santa Ana Torito	Amaranthus cruentus Amaranthus spinosus Annona cherimola Artemisia absinthium Puddleia sp. Caladium bicolor Cecropia grandiflora Coix mayuen Fragaria chilensis Gerbera jamesoni Heliotropium peruvianum	Throughout the year
Orthotomus jamaicensis Dallas Paso Ancho	Coffea arabica Cucurbita pepo Ocimum basilicum	March, August. Abundant in flower of S. splendens
MIRIDAE Calondas fasciatus Dist. San Pedro	Hamelia erecta	August
Ceratocapsus punctulatus (Reut.) Paso Ancho	Linum usitatissimum	July
Collaria oleosa (Dist.) Paso Ancho San Isidro de Coronado Waldeck	Amaranthus cruentus Apeita tiberton Arachis hypogaea Capricola dactylon Coix mayuen Cucurbita pepo	f f f f f f
Creontiades rubrinervis (Stål) Paso Ancho San Isidro de Coronado San Isidro del General	Amaranthus spinosus Crotalaria spectabilis Dianthus caryophyllus Fragaria chiloensis	December
	Hibiscus sabdariffa Holcus sorghum Lucuma mamosa Medicago sativa Morus rubra Ocimum basilicum Portulaca oleracea Phaseolus helvolicus Phaseolus vulgaris Salvia splendens Solanum tuberosum Petunia hybrida Salvia splendens Solanum tuberosum Holcus halepensis Holcus sorghum Ixophorus unisetus Paniceum barbinode Solanum tuberosum Triticum aestivum Hibiscus sabdariffa Holcus halepensis Holcus sorghum Ligustrum japonicum	

Insect and locality	Collected on	Date and name
Oreanthus rufinervis-- Cont'd.	<i>Eleotinus tenebrum</i> <i>Paricum martinide</i> <i>Phaseolus vulgaris</i> <i>Phaseolus vulgaris</i> <i>Solanum tuberosum</i>	December <i>Solanum tuberosum</i> <i>Secundaria nimbina</i> <i>Telantiera ficoides</i> <i>Triticum aestivum</i> <i>Vitis vinifera</i> <i>Zea mays</i>
<i>Cyrtocarpus caliginos</i> (Stål) San Isidro de Coronado	<i>Ipomoea purga</i>	December
<i>Cyrtocarpus notatus</i> (Dist.) Palmares de San Ramon San Isidro del General San Isidro de San Ramon San Pedro de Barba Santa Barbara Santa Rosa Turrialba		
<i>Eurycypitia vestitus</i> Dist. San Pedro San Raphael de Coronado	<i>Cattleya dowiana</i> <i>Cattleya skinneri</i> <i>Epidendrum prismatocarpum</i> <i>Epidendrum violaceum</i> <i>Lycaste deppei</i>	F f f f f January, March to May

Insect and locality	C o l l e c t e d o n	Date and notes
<i>Halticus bracteatus</i> (Say)		
Paso Ancho	<i>Althaea rosea</i>	f
San Isidro del General	<i>Amaranthus spinosus</i>	f
San Pedro	<i>Apeita titourbon</i>	f
	<i>Apium graveolens</i>	f
	<i>Arachis hypogaea</i>	f
	<i>Brassica oleracea capitata</i>	f
	<i>Brassica rape</i>	f
	<i>Chenopodium ambrosioides</i>	f
	<i>Citrullus vulgaris</i>	f
	<i>Citrus sinensis</i>	f
	<i>Crotalaria fulva</i>	f
	<i>Cucumis sativus</i>	f
	<i>Cucurbita ficifolia</i>	f
	<i>Cucurbita pepo</i>	f
	<i>Cynara scolymus</i>	f
	<i>Dahlia rosea</i>	f
	<i>Eschscholtzia californica</i>	f
	<i>Helianthus annuus</i>	f
	<i>Ipomoea batatas</i>	f
<i>Jornandus intermedius</i> Dist.	<i>Onyota edulis</i>	f
Paso Ancho		
San Isidro de Coronado		
San Pedro		
<i>Lampethusa anatina</i> Dist.		
Paso Ancho	<i>Gliricidia maculata</i>	
San Isidro del General	<i>Hamelia erecta</i>	
Waldeck	<i>Jussiaea decurrens</i>	
	<i>Theobroma cacao</i>	
	<i>Ipomoea purga</i>	
	<i>Lactuca sativa</i>	
	<i>Linum usitatissimum</i>	
	<i>Melilotus alba</i>	
	<i>Nicotiana tabacum</i>	
	<i>Petroselinum hortense</i>	
	<i>Petunia hybrida</i>	
	<i>Phaseolus vulgaris</i>	
	<i>Radicula armoracia</i>	
	<i>Raphanus sativus</i>	
	<i>Portulaca oleracea</i>	
	<i>Rheum rhabonticum</i>	
	<i>Solanum nigrum</i>	
	<i>Solanum tuberosum</i>	
	<i>Solanum torvum</i>	
	<i>Tetragonia expansa</i>	
	<i>Triticum aestivum</i>	
	<i>Triumfetta josefina</i>	
	<i>Tatebaia pentaphylla</i>	
		January, February, May, June, August to December
		February, April

Insect and locality	Collection	Date and notes
<p><i>Lygus bellus</i> Sign. Paso Ancho San Isidro de Coronado San Jose San Rafael de Coronado N</p>	<p><i>Aceratus caryalides</i> <i>Allium pepo</i> <i>Amaranthus cruentus</i> <i>Abutilon grandifolium</i> <i>Asarum officinale</i> <i>Sida glabra</i> <i>Passiflora foetida</i> <i>Celastrus cristata</i> <i>Coffea arabica</i> <i>Caryanthus</i> sp. <i>Coix lacryma-jobi</i> <i>Coix mayana</i> <i>Conostegia lanceolata</i> <i>Curculio pepo</i> <i>Eugenia rosmarinifolia</i></p>	<p><i>Heliathus annus</i> <i>Hibiscus sabdariffa</i> <i>Impatiens</i> <i>Myrsine sylvatica</i> <i>Panicum barbinode</i> <i>Phaseolus lunatus</i> <i>Phaseolus vulgaris</i> <i>Sesuvium portulacastrum</i> <i>Solanum elaeagnifolium</i> <i>Tetragonia expansa</i> <i>Vitis vinifera</i> <i>Vitis rotundifolia</i> <i>Zea mays</i> <i>Zinnia elegans</i></p>
<p><i>Mela unicolor</i> Dist. Paso Ancho San Pedro</p>	<p><i>Erythrina rubrinervia</i></p>	<p>October. A pest of <i>Erythrina</i> spp.</p>
<p><i>Monalonion annulipes</i> Sign. Paso Ancho Waldeck</p>	<p><i>Hibiscus sabdariffa</i></p>	<p>April, August, October</p>
<p><i>Neurocolpus mexicanus</i> Dist.</p>	<p><i>Citharexylum caudatum</i> <i>Gossypium barbadense</i> <i>Impatiens balsamina</i> <i>Indigofera suffruticosa</i> <i>Lantana camara</i></p>	<p>May, July, August to November</p>
<p><i>Paracalocoris annulatus</i> Dist. Paso Ancho</p>	<p><i>Dianthus caryophyllus</i> <i>Erythrina rubrinervia</i> <i>Fortunella japonica</i> <i>Hamelia erecta</i></p>	<p>May, June, September to December</p>

Insect and locality	C o l l e c t e d o n	Date and notes
Paracalocoris junceus (Stål)	Salvia splendens	
Paracalocoris molliculus Dist. Alajuela	Lantana camara	March
Platytyellus lotipennis (Stål)	Bidens pilosa	January, July,
Paso Ancho	Phaseolus vulgaris	October
Santa Ana	Sesamum orientale	
Polymerus cuneatus (Dist.)	Anacanthus cruentus	April to October
Paso Ancho	Asclepias curassavica	
San José	Beta vulgaris cicla	
	Byrsonima crassifolia	f
	Cestrum aurantiacum	
Pycnoderes atratus (Dist.)	Grass	February,
Paso Ancho	Hibiscus sabdariffa	November
Paves de Turriolba		
Pycnoderes incurvus (Dist.)	Ageratum conyzoides	
Pycnoderes quadrimaculatus	Coix mayuen	January, August,
Guer.	Cucurbita pepo	October, December
Paso Ancho	f	
San Isidro de Coronado	Inca roussovilana	
San Pedro	Griseobasis sp.	
Reuterocorypus ornatus (Reut.)	Anacanthus spinosus	May, August
San José		
Stenobema guatemalana (Dist.)	Pennisetum clandestinum	May
Rereno Redonio		
Sysinus centralis Tist.	Canna indica	August, September,
Paso Ancho	Persea americana	October, November
San Pedro	Sapium aucuparium	f

Insect and locality	Collection	Date and notes
NABIDAE		
<i>Nabis capilliformis</i> Germ. San Isidro del General San Pedro	<i>Solanum tuberosum</i>	January, February
<i>Nabis constrictus</i> Champ. San Pedro Waldock	<i>Eusebius vulgaris</i>	April, July, December
<i>Nabis aigriventris</i> Stål San Pedro	<i>Amaranthus c.</i> <i>Crotalaria spectabilis</i>	June, July
NEIDIDAE		
<i>Jalysus mollitus</i> Dist. San Pedro Santa Ana	<i>Buddleia</i> sp. <i>Eyrsoxima crassifolia</i> <i>Citrus aurantifolia</i> <i>Coix mayuen</i>	April to August
<i>Jalysus reversus</i> Van D. San Pedro	<i>Amaranthus cruentus</i>	January, May
PENTATOMIDAE		
<i>Acrosternum marginatum</i> (Beauv) Paso Ancho San Isidro del General San Jose	<i>Beta vulgaris</i> cila f <i>Cajanus bicolor</i> <i>Coix mayuen</i> <i>Hibiscus rosa-sinensis</i>	February to Octo- ber
<i>Chlorocoris aberrans</i> Dist.	<i>Casimiroa edulis</i>	October

Insect and locality	C o l l e c t e d o n		Date and notes
Chlorocoris atrispinus Stål Paso Ancho San Pedro Waldeck	Antigonon leptopus Casimiroa edulis Ixophorus unisetus Psidium friedrichsthalianum	f f f f	Theobroma cacao April, December
Cosmopepla coeruleata Montd. Paso Ancho San Pedro	Apium armi Leonturus sibericus	f f	September, November
Edessa cornuta Fernald	Caena indica Erythrina rubranervia Ipomoea purga		Panicum bartinode Vernonia brachiata January
Edessa junix Stål Paso Ancho Waldeck	Elaeis guineensis Theobroma cacao		Trichilia havanensis April, July
Edessa nigripinna Dallas San Pedro	Cornutia pyramidata	f	September
Edessa rufomarginata (Deg.) San Isidro del General Santa Ana	Saccharum officinarum Solanum torvum	f f	February July
Edessa salvini Dist. Paso Ancho			July, August, September
Edessa vinula Stål San Isidro del General	Mangifera indica		February

Type locality	Collection	Date and
<i>Euschistus civilis</i> (Germ.) Paso Ancho San Isidro del General	<i>Trassica japonica</i> <i>Myrsine crassifolia</i> <i>Cleome spinosa</i> <i>Polygonum punctatum</i>	f March, May, August, September
<i>Euschistus bifloris</i> Stål Paso Ancho San Isidro de Coronado San Pedro	<i>Bidens pilosa</i> <i>Cassia cristata</i> <i>Leuca sativa</i> <i>Linum usitatissimum</i>	June, August, September October, November, December
<i>Euschistus crenator</i> (F.) Paso Ancho	<i>Croton gossypifolius</i> <i>Myosotis sylvatica</i>	October
<i>Euschistus spurculus</i> Stål Paso Ancho	<i>Bidens pilosa</i>	June
<i>Eutayracinus floridanus</i> (L.) San Pedro		October. Predacious on <i>Antianthe expansa</i> (Germ.) and <i>Colaspis</i> <i>prasina</i> Jacoby
<i>Homaemus proteus</i> Stål San Pedro	<i>Ligustrum japonicum</i>	February
<i>Macropygium reticulare</i> (F.) San Isidro del General	<i>Musa paradisiaca</i>	June
<i>Mecistorhinus melanoleucus</i> (Westw.) Paso Ancho	<i>Mulpighia glabra</i> <i>Musa paradisiaca</i>	June, September
<i>Mecistorhinus tripterus</i> (F.) San Isidro del General	<i>Chayota edulis</i>	February
	f <i>Passiflora ligularis</i>	

Insect and locality	Collection	Date and notes
Mormidea notulata (H.-S.) Paso Ancho	Bryophyllum pinnatum Chaetium bromioides Cucurbita pepo Hibiscus escelentus Hibiscus sabdariffa	Ipomoea purga Meibomia sp. Vernonia brachiata Xanthosoma nelleborii- folium
Mormidea ypsilon (L.) San Pedro Waldeck	Coix lacryma-jobi Panicum barbinode Paspalum fasciculatum	July, August
Nerara viridula (L.) Paso Ancho Alajuelita San Isidro de Coronado	Annona cherimola Brassica japonica Cajanus bicolor Cassia alata Cattelya dowiana Cobaea scandens Coix mayuen Commelina sp. Crotalaria striata Dianthus caryophyllus Galinsoga hispida Helianthus annuus Hibiscus rosa-sinensis Hibiscus sabdariffa Hymenaea courbaril	Linum usitatissimum Malacra radiata Passiflora edulis Passiflora quadrangularis Phaseolus helvulus Phaseolus lunatus Phytolacca octandra Polygonum punctatum Radicula armoracia Ricinus communis Rosa spp. Salvia splendens Trichopilia marginata Vernonia brachiata
Pharypia nitidiventris (Stål) San Pedro	Randia mitis	February, June, October
Ptenodorus guildinii (Westw.) San Isidro del General	Psidium guajava Spondias mombin	February

Podisus congrevis (Stål)	Alameda Querindia Masa sapientum	Verisima marticensis	April, July, December
Paso Ancho San Isidro de Coronado San Pedro			
Podisus lineolatus (H.-S.)	inva roussoviana	Polygonum punctatum	August, October
Paso Ancho San Pedro			
Podisus tnetis (Stål)	Theobroma cacao		April
Walieck			
Proxys punctulatus (Beauv.)	Grass	Vernonia brachiata	June
Thyanta perditior (F.)	Althaea rosea	Heliotropium peruvianum f	Throughout the year
Alajuela	Amygdalus davidiana	Hibiscus sabdariffa	
Alajuelita	Amygdalus persica	Holcus sorghum	
Paso Ancho	Apium anni	Impatiens balsamina	
San Isidro del General	Bidens pilosa	Indigofera suffruticosa	
Santa Barbara de Heredia	Calliandra grandiflora	Malus sylvestris f	
	Cajanus bicolor	Psidium molle	
	Cassia sophora	Saccharum officinarum	
	Cucurbita edulis	Salvia splendens f	
	Citrus limonia	Sida rhombifolia	
	Coffea arabica	Triunfetta josefina	
	Crotalaria juncea	Vernonia brachiata	
	Crotalaria striata	Vitis vinifera	
	Crotalaria vitellina	Zea mays	
	Dianthus caryophyllus		
	Fragaria chiloensis		
	Hamelia erecta		
	Helianthus annuus		

Insect and locality	Collected on	Date and notes
<p> PHYTOCORIDAE <i>Dysdercus flavo-limbatus</i> Stål <i>Dysdercus minimus</i> Mussey <i>Alajuela</i> <i>Santa Ana</i> </p>	<p> <i>Coix lacryma-jobi</i> <i>Acnistus arborescens</i> <i>Althaea rosea</i> <i>Amaranthus cruentus</i> <i>Annona muricata</i> <i>Asclepias curassavica</i> <i>Bidens pilosa</i> <i>Eryophyllum pinnatum</i> <i>Eudaleia</i> sp. <i>Cestrum macrophyllum</i> <i>Carysanthemum maximum</i> <i>Citrus rexylum caudatum</i> <i>Citrus aurantifolia</i> <i>Citrus limetta</i> <i>Citrus limonia</i> <i>Coix mayuen</i> <i>Crotalaria striata</i> <i>Erythrina rubrinervia</i> <i>Guazuma ulmifolia</i> </p>	<p> <i>Theobroma cacao</i> <i>Mamelia erecta</i> <i>Hibiscus esculentus</i> <i>Hibiscus rosa-sinensis</i> <i>Impatiens balsamina</i> <i>Ipomoea purga</i> <i>Ipomoea tiliacea</i> <i>Leonurus sibiricus</i> <i>Maiacra radiata</i> <i>Persea americana</i> <i>Sedum</i> sp. <i>Sida raombifolia</i> <i>Solanum nigrum</i> <i>Solanum tuberosum</i> <i>Taraxacum officinale</i> <i>Theobroma cacao</i> <i>Verbesina turbacensis</i> <i>Vernonia orechiata</i> <i>Zea mays</i> </p>

Insect and locality

Collected on

Date collected

Dysdercus orlitzkyi (H.-S.) Paso Ancho Torito	Calceolaria esulcatus Calceolaria costaricensis Culca pentanema Climacium cuneatum Tenella sp. (Catalina) Gossypium caribense Grass Miliusa abelmoschus	 f f f f f f f	Miliusa mutabilis Miliusa radiata Pelargonium conale Persia americana Schinus molle Serjania sp. Trichilia havanensis Coffea villosa	 f f f f f f f	January June August Most important part noted on cotton
Dysdercus oncopeltus Dist. San Pedro	Miliusa sylvestris				April
Dysdercus ruficeps (Perty) Waldeck	Theobroma cacao				April
Euryopthalmus cinctus (H.-S.) San Isidro del General San Pedro Santa Ana Torito Waldeck	Ananas sativus Heliotropium peruvianum Ipomoea sp. Miliusa radiata Persia americana Zea mays	 f			April, June, July
Stenomacra marginella (H.-S.) Paso Ancho Santa Barbara de Heredia	Acnistus arborescens Ageratum conyzoides Amaranthus spinosus Averrhoa carambola Bauhinia nonandra Bidens pilosa Bombax ellipticum Brassica japonica Byrsonima crassifolia Calonyction aculeatum Calyptranthes costaricensis	 f f f f f f	Casimiroa edulis Cassia sophora Cedrela glauvovii pu- berula Cedrela montana mexi- cana Cestrum lanatum Cestrum macrophyllum Citrus auratifolia Citrus limonia Citrus medica	 f f f	

Insect and locality	C o l l e c t e d o n	Date and notes
Stenomacra marginella---Cont'd.	Citrus nobilis x C. paradi- si	Melanthera aspera
	Coix lacrymar-jobi	Musa sapientum
	Coleus blumei	Oreopanax sp.
	Conostegia macrantha	Panicum barbinode
	Cornutia cymosa	Persea pittieri
	Cornutia pyramidata	Phoebe tonduzii
	Cucurbita pepo	Podocarpus sp.
	Dahlia rosea	Poinsettia pulcherrima
	Dillenia indica	Psidium guajava
	Eriobotrya japonica	Randia nitis
	Gossypium barbadense	Rumex crispus
	Guarea caoba	Sapium aucuparium
	Indigofera suffruticosa	Solanum tuberosum
	Inga roussoviana	Spondias cytherea
	Ipomoea purga	Tabebuia guajacan
	Lantana camara	Tabebuia pentaphylla
	Malus sylvestris	Tephrosia toxicaria
	Martinezia caryotaefolia	Trena micrantha
		Vitis rotundifolia
		Xanthosoma nelleboriifol- ium
REDUVIIDAE		
Empicornis armatus Champ.?	Persea americana	June
San Pedro		
Sinea raptorica Stål	Citharexylum caudatum	November
Paso Ancio		
SCUTELLARIIDAE		
Pachycoris torridus (Scop.)	Cupressus benthami	January,
San Isidro de Coronado	Musa paradisiaca	June

Local Locality

Collected on

Date of Collection

TINIAN

Corythucha planaria Hb.
San Pedro del General

Corythucha rosae (F.)
San Pedro del General

Corythucha spinosa (Duges)
San Pedro

Gargaphia patricia (Stål)
Alajuelita
La Carpintera

Leptobyrsa chiriquensis
Champ.
Paso Ancho

Leptobyrsa tumida Champ.
Paso Ancho

Piesma cinerea (Say)
Torito

Teleonemia sacchari (F.)
Orosi
San Pedro

Solanum torvum

Annona muricata
Artocarpus communis
Plinia sapida
Canavalia ensiformis

Triumfetta josefina

Citrus limonia

Malpighia glabra

Ipomoea sp.

Lantana camara

Melastoma aspera

Ricinus communis
Xanthosoma sagittifolium

February, March

January, February,
March, May, July,
August

January, February, May,
September

February

September

April, May, June,
October, November,
December

July

February,
September

HOMOPTERA

Insect and locality	Collected on	Remarks
<p>ALEYRODIDAE</p> <p>Aleurocanthus woglumi Ashby Orosi Wallack</p> <p>Aleuroplatys oculirensiformis Quaint. and Baker Pico Arco</p> <p>Aleurotarix novardi (Quaint.) Alajuelita San Isidro del General San Josecito</p>	<p>Annona reticulata Annona squamosa Citrus limetta Citrus paradisi Passiflora punctata Bleeker gracilis Citrus limetta Citrus sinensis Citroreoxylum caudatum</p> <p>Fortunella japonica Lucuma mammosa Roeidia edulis Tricallia havanensis Eugenia uniflora Malpighia glabra Psidium guajava Spondias cythera</p>	<p>Preyed on by Pentilia discors Gorb.</p> <p>November</p> <p>Throughout the year. Preyed on by Pentilia dis- cors</p>

Insect and locality	Collector	Date of collection
<p><i>Alcyonellus excolitae</i> Quaint. San Pedro San Jose San Pedro</p>	<p><i>Citrus aurantiifolia</i> <i>Fertissella (apuleia) f.</i></p>	<p>June, October</p>
<p>APHIDIDAE <i>Aphis Grayi</i> Gloy. Paso Ancho San Jose</p>	<p><i>Passiflora peruviana</i> f. <i>Hibiscus esculentus</i> f.</p>	<p>May, September, November. Preyed on by <i>Nea retro-</i> <i>spiciens</i> Cr.</p>
<p><i>Aphis illinoensis</i> Skim. <i>Aphis nerii</i> Boyer Cross Paso Ancho</p>	<p><i>Vitis tiliaefolia</i></p>	<p>October to December</p>
<p><i>Aphis pomi</i> Deg. Paso Ancho San Rafael de Coronado</p>	<p><i>Chrysanthemum maximum</i> f. <i>Gerbera jamesoni</i></p>	<p>Preyed upon by <i>Cycloneda</i> san- <i>guinea</i> L.</p>
<p><i>Aphis rumicis</i> L.? San Pedro</p>	<p><i>Chrysanthemum maximum</i> f. <i>Gerbera jamesoni</i></p>	<p>January to March, July to December. Tended by <i>Solenopsis geminata</i> F.</p>
<p><i>Aphis spiraeicola</i> Patch</p>	<p><i>Citrus sinensis</i> f.</p>	<p>March. Tended by <i>S. geminata</i></p>
<p><i>Ceratephis lataniae</i> (Sdv.) Rio Grande</p>	<p><i>Epidendrum violaceum</i></p>	

Insect and Locality	Collection	Insects and Notes
<i>Eriosema lanigerum</i> (Humm.) San Isidro de Coronado San Jose de La Montana San Pedro		1,500 adults (<i>Aphidius mali</i> Hal.) liberated.
<i>Rhopalosiphum pseudo-brassicarum</i> (Davis) Crosti San Isidro de Coronado Santa Ana		January, July, November
<i>Toxoptera aurantiae</i> Boyer Santa Ana Santa Barbara de Heredia Terrera	<i>Citrus aurantium</i> f <i>Citrus limetta</i> f <i>Citrus medica</i> f	Preyed upon by <i>Coccinella septempunctata</i> , <i>Cyclonema sanguinea</i> , <i>L. Azaya</i> inter- res Mull., <i>Penttilia</i> discors
CERICOPIDAE <i>Chastoptera funesta</i> Stål Crosti	<i>Acanthus arborescens</i> <i>Dahlia sp.</i> (Catalina) <i>Hibiscus sabdariffa</i> <i>Imatiens cultani</i> <i>Iretine aspera</i> <i>Ixora chinensis</i> <i>Ocimum basilicum</i>	<i>Phaeococcus vulgaris</i> <i>Psidium friedrichsthalii</i> - annae f <i>Rosmarinus officinalis</i> f <i>Ruellia equisetiformis</i> f <i>Vigna sesquipedalis</i>
<i>Chastoptera castana</i> (Say) Paso Ancho	<i>Calliandra grandiflora</i>	July, September

Insects and Spiders	Collected at	Date collected
Eurytoma ernstii Fowl. Paso Arco	Clerodendron glaberrimum C. glaberrimum C. glaberrimum	August to November.
Tomaspis lineata (Say)	Asclepias crassifolia Bignonia villosa Clerodendron fragrans Cecropia peltata Celastrus scandens Nicotiana glauca Polygonum punctatum	June, September.
Tomaspis lineata Say San Pedro	Polygonum punctatum	May
Tomaspis lineata (Walk.)? Sabanilla	"Espino"	October
Tomaspis postica (Walk.) Orcoi Paso Arco	Grass Hibiscus sablerifolia Musa sapientum	February, March, November
CHERMIDAE		
Freysuila ernstii Schwarz	Cedrela glaziovii puberula	Injurious
Trioza nicaraguensis Crawford. San Pedro	Bryophyllum pinnatum Rumex crispus	January

Insect and locality	Collection	Date and notes
CICADYLLIDAE		
Acanthia (Acanthia) Cera	Liatris californica	April, July, October
Paso Ancho	Tetragonia expansa	
Acanthia (Acanthia) Cera	Acanthia arborescens	Throughout the year.
Paso Ancho	Acanthia arborescens	
Paso Ancho	Acanthia arborescens	
Acanthia (Acanthia) Cera	Acanthia bicolor	
Paso Ancho	Acanthia bicolor	
Acanthia (Acanthia) Cera	Acanthia bicolor	
Paso Ancho	Acanthia bicolor	
Paso Ancho	Acanthia bicolor	
Paso Ancho	Acanthia bicolor	
Paso Ancho	Acanthia bicolor	
Paso Ancho	Acanthia bicolor	
Paso Ancho	Acanthia bicolor	
Paso Ancho	Acanthia bicolor	
Acanthia (Acanthia) Cera	Acanthia bicolor	
Paso Ancho	Acanthia bicolor	
Paso Ancho	Acanthia bicolor	
Paso Ancho	Acanthia bicolor	
Paso Ancho	Acanthia bicolor	
Paso Ancho	Acanthia bicolor	
Paso Ancho	Acanthia bicolor	
Paso Ancho	Acanthia bicolor	
Paso Ancho	Acanthia bicolor	
Paso Ancho	Acanthia bicolor	
Paso Ancho	Acanthia bicolor	

Locality	Collected at	Date
<i>Amelanchier</i> L. Mill. Ceylon	<i>Terminalia brachylepis</i>	February
<i>Andropogon squarrosus</i> L. Pan. Africa	<i>Cordia alliodora</i> <i>Peperomia</i>	July, September
<i>Athyrium</i> L. Fowl. Wolfeck	<i>Hieracium</i>	July
<i>Calceolaria</i> L. Fowl. Gualaquiza Orosi	<i>Annona cherimola</i> <i>Annona muricata</i> <i>Caribaea</i> <i>Coffea arabica</i>	March
<i>Calceolaria</i> L. Fowl. San Pedro Tarrazu	<i>Coffea arabica</i> <i>Cordia</i>	August, September, December
<i>Caraculifera</i> L. Fowl. San Rafael de Coronado	<i>Canna indica</i> <i>Coffea arabica</i> <i>Digitaria</i> sp. <i>Linum usitatissimum</i>	Throughout the year
<i>Chamaecyparis</i> L. Fowl. Wolfeck	<i>Theobroma cacao</i>	January, July
<i>Chlorotettix curvicauda</i> L. Fowl. Wolfeck	<i>Zea mays</i>	April

Insect and locality	C o l l e c t e d o n	Date and notes
Cicadella enita (Fowl.)	Heliconia imbricata	Abundant
Cicadella areolata (Siam.)	Acalypha wilkesiana	Hibiscus sabdariffa
Crosi	Ageratum conyzoides	Impatiens balsamina
Santo Ana	Aithya rosea	Inga roussoviana
Tarragu	Beta vulgaris cicla	Ixochorus unisetis
Ujarras	Bidens pilosa	Lactuca sativa
	Bryconina cressifolia	Limon usitatissimum
	Cajanus bicolor	Lippia berlandieri
	Canna indica	Heliconia sp.
	Carissa grandiflora	Mimosa sp.
	Citrus limonia	Passa sapientum
	Correa arabica	Persea nittieri
	Croton corymbosifolium	Phaseolus heliophilus
	Cyperus alternifolius	Phaseolus tenuifolius
	Daucus carota	Pisonia nolle
	Eriobotrya japonica	Sesuvium orientale
	Galinsoga asperula	Solanum tuberosum
	Gossypium barbadense	Petragonia expansa
	Helianthus annuus	Verbena turbacensis
	Holeus vulgare	Xanthosoma heliophyllum
	Hibiscus rosa-sinensis	Zantho coccinello
Cicadella coerulescens Sign.	Acalypha arborescens	Jussiaea decurrens
Juan Vinas	Beta vulgaris cicla	Leonurus sibiricus
La Capintan	Cajana pentandra	Melibomia spp.
Pavas de Turrialba	Caryota edulis	Melanthera aspera
Tarragu	Citrus costaricensis	Mentha sativa
	Citrus limonia	Petroselinum hortense
	Clerodendron fragrans	Polygonum punctatum
	Coffea arabica	Parca
	Coffea mayuen	Tagetes patula
	Cucurbita pepo	Triticum aestivum
	Impatiens balsamina	Verbena spp.
	Ipomoea purga	Zea mays
	Ipomoea purga	f

Throughout the year

Insect and locality	Collected on	Date and notes
Cicadella miniaticipes--Cont'd.	<i>Dahlia rosea</i> <i>Euphorbia uniflora</i> <i>Euphorbia hoffmanniana</i> <i>Fraxinia chilensis</i> <i>Gerbera jamesoni</i> <i>Heliotropium peruvianum</i> <i>Hibiscus sabdariffa</i> <i>Holcus halapensis</i> <i>Impatiens balsamina</i> <i>Ipomoea tillocea</i> <i>Ixochloris missotus</i> <i>Lactuca sativa</i> <i>Lilium longiflorum</i> <i>Mangifera indica</i>	<i>Meibomia</i> sp. f <i>Morus rubra</i> <i>Nyctotis sylvatica</i> <i>Papaver rhoeas</i> f <i>Pennisetum purpureum</i> f <i>Phaseolus helvolus</i> <i>Phoenix canariensis</i> <i>Raphanus sativus</i> <i>Rumex crispus</i> <i>Sesamum orientale</i> <i>Tephrosia toxicaria</i> <i>Tournefortia foetidissima</i> <i>Tragopogon porrifolius</i> <i>Verbena</i> spp.
Cicadella mallicella (Fowl.)	<i>Ageratum conyzoides</i> <i>Althaea rosea</i> <i>Archibis hypogaea</i> <i>Brassica japonica</i> <i>Lantana camara</i>	<i>Lycopersicon esculentum</i> <i>Psidium melle</i> <i>Sporobolus indicus</i>
Cicadella venatoria (Say)	<i>Acalypha wilkesiana</i> <i>Ageratum convzoides</i> <i>Althaea rosea</i> <i>Anacardium occidentale</i> f <i>Apeiba tibourbon</i> f <i>Apium</i> sp. <i>Artemisia absinthium</i> <i>Asclepias curassavica</i> <i>Beta vulgaris cicla</i> <i>Bidens pilosa</i> <i>Borago officinalis</i> <i>Brassica oleracea</i> <i>Bryophyllum pinnatum</i>	<i>Archiosia costaricensis</i> <i>Eyrsonima crassifolia</i> f <i>Cajanus bicolor</i> f <i>Canna indica</i> <i>Ceiba pentandra</i> f <i>Cirsium costaricensis</i> <i>Citharexylum caudatum</i> <i>Coix lacryma-jobi</i> <i>Coix mayuen</i> <i>Cosmos bininnatus</i> <i>Cucurbita pepo</i> <i>Cynara scolymus</i> f <i>Datura stramonium</i>

Insect and locality	C o l l e c t e d o n		Date and notes
<i>Cicadella pulchella</i> (Guer.)-- Cont'd.	<i>Jussiaea decurrens</i> <i>Mimosa asperata</i> <i>Petroselinum hortense</i> f <i>Phaseolus helvolus</i>	<i>Polygonum punctatum</i> <i>Solanum tuberosum</i> <i>Valerianoides cayennense</i> f <i>Verbena</i> spp. f	September
<i>Cicadella quadriplagiata</i> (Walk.) Santa Barbara de Heredia Tarrazu	<i>Coffea arabica</i>		
<i>Cicadella reservata</i> (Fowl.) Alajuelita	<i>Antigonon leptopus</i> <i>Blakea gracilis</i> <i>Cajanus bicolor</i> f <i>Cassia alata</i> <i>Citrus limonia</i> <i>Dovyalis hebecarpa</i> f <i>Eriobotrya japonica</i> f <i>Ficus carica</i> f <i>Gardenia jasminoides</i> f <i>Gossypium barbadense</i> f <i>Hedychiium coronarium</i> <i>Hibiscus esculentus</i>	<i>Hibiscus sabdariffa</i> f <i>Egyptis suaveolens</i> <i>Ixora c. minensis</i> <i>Sylvestris malus</i> <i>Phaseolus helvolus</i> <i>Psidium friedrichsthalianum</i> <i>Psidium guajava</i> <i>Rosa</i> spp. <i>Salvia hispanica</i> <i>Trichilia havanensis</i> <i>Zinnia elegans</i>	October
<i>Cicadella similis</i> (Walk.) Alajuelita Guadalupe Guayabo Pavas de Turrialba San Isidoro de Coronado San Isidro del General Santa Barbara de Heredia Waldock	<i>Ageratum conyzoides</i> <i>Apeiba tibourbon</i> <i>Arachis hypogaea</i> f <i>Boenmeria nivea</i> <i>Porago officinalis</i> <i>Eryophyllum pinnatum</i> <i>Celosia cristata</i> <i>Coix mayan</i> <i>Cratalaria striata</i> <i>Elaeis guineensis</i> <i>Gnathelma utilis</i> <i>Heliotropium peruvianum</i>	<i>Hibiscus sabdariffa</i> <i>Impatiens balsamina</i> <i>Ixophorus unisetus</i> <i>Jussiaea decurrens</i> <i>Linum usitatissimum</i> <i>Lycopersicum esculentum</i> <i>Meibomia</i> sp. <i>Melanthra aspera</i> <i>Mentha sativa</i> <i>Nicotiana tabacum</i> <i>Pelargonium zonale</i> <i>Pennisetum purpureum</i> f	Throughout the year

Locality	Collected on	Date and notes
Cicadella similis--Cont'd.	<i>Persea caribaea</i> <i>Pithecellobium birtense</i> <i>Philadelphus trichapetalus</i> <i>Plantago major</i> <i>Rayonum cretatum</i> <i>Solanum nigrum</i>	<i>Sorolobus indicus</i> <i>Tragopogon porrifolius</i> f <i>Triplascum latifolium</i> <i>Triticum aestivum</i> f <i>Zea mays</i> f
Cicadella sociata (Fowl.) Trientalbe	<i>Vernonia brachiata</i>	February Abundant
Cicadella testudinaria (Fowl.) San Isidro del General Santa Barbara de Heredia Tarrazu	<i>Acnistus arborescens</i> <i>Alnus acuminata</i> f <i>Anacardium occidentale</i> f <i>Erysonima crassifolia</i> <i>Cajanus bicolor</i> <i>Canna indica</i> <i>Cassia spectabilis</i> <i>Chelcas exotica</i> <i>Cornus sanguineus</i> <i>Croton gossypifolium</i> <i>Crotalaria striata</i> <i>Dahlia rosea</i> <i>Eugenia malaccensis</i> <i>Gardenia jasminoides</i> f <i>Heliotropium peruvianum</i> <i>Hibiscus abelmoschus</i>	<i>Hibiscus esculentus</i> f <i>Ilex chinensis</i> <i>Laennurus sibericus</i> <i>Ligustrum japonicum</i> <i>Melastoma flabrum</i> <i>Mucosotis sylvatica</i> <i>Perisetia calcherrima</i> <i>Psidium cattleianum</i> <i>Psidium fr. trichostanthum</i> f <i>Pyrus communis</i> <i>Serjania</i> sp. <i>Schinus molle</i> <i>Solanum nigrum</i> <i>Terminalia catappa</i> <i>Vinca rosea</i> <i>Zinnia elegans</i>
Cicadula maidis DeLong and Walcott San Isidro del General	<i>Coix mayuen</i> <i>Ficus carica</i> <i>Phaseolus vulgaris</i>	March

Insect and locality	C o l l e c t e d o n	Date and notes
Cyrtodisca major (Sign.) Tarrazu	Coffea arabica	August
Deltoccephalus flavicosta Stål	Coix mayuen Fragaria chiloensis	August
Diedrocephala limbaticollis (Stal)	Acnistus arborescens Bidens pilosa	Throughout the year
Guadalupe	Canangium odoratum	
Paso Ancho	Cestrum lanatum	
San Pedro	Chayota edulis	
	Citrus limonia	
	Codiaeum variegatum	
	Conostegia lanceolata	
	Cornutia pyramidata	
	Croton gossypifolium	
	Cucurbita pepo	
Diedrocephala sanguinolenta (Coqueb.)	Erythrina rubrinervia	f
	Gossypium barbadense	
Diedrocephala satella (Fowl.)	Coix lacryma-jobi	f
	Ipomoea purga	
Diestostemma ruforeticulatum Schmidt Guadalupe Paso Ancho Santa Barbara	Citrus limonia Coffea arabica	f f f f
	Tabernaemontana bignoniace- flora	January July to December
	Hibiscus rosa-sinensis Inga roussovia Sterculia diversifolia	Causes tip-wilt of coffee

Locality	Collected in	Date and notes
Dioscorea cordata Raf. Alajuela Paso Ancho San Pedro	Saururus cuneatella f Eriobotrya japonica Peltandra male Lernia catappa	Late, July, October to December
Draculacecula lenticula Bell. La Gloria	Bellardia pilosa Coix nageia Panicum maximum Pennisetum purpureum f	June to October
Draculacepala soluta Guss. Guadalupe Paso Ancho Santa Ana	Coix nageia Holcus sorghum Impatiens belsamina Scorolobus indicus	July to December
Empoasca perelegans Cman	Arrora squarrosa Sapium aucuparium	June, July
Erythroneura elegantula Gsb.? San Pedro	Vernonia brachiata f	January, February, April, July

Insect and locality	C o l l e c t e d o n	Date and notes
Exitianus picatus (Gibs.) Pavas de Turrialba San Isidro de Coronado	Artemisia absinthium f Coix mayuen Cyclanthera pedata Fragaria chiloensis	August to November
Graphocephala aurolineata (Fowl.) San Pedro	Bidens pilosa	August
Graphocephala coccinea (Forst.) Alajuelita San Isidro de Coronado Santa Ana	Acalypha wilkesiana Amaranthus cruentus Amygdalus davidiana f Aracardium occidentale Artemisia absinthium Averrhoa carambola Paulinia monandra Paulinia violacea Bixa orellana Eysenhardia crassifolia Cajanus bicolor Callistemon lanceolatus Cerevalia ensiformis Cavissa grandiflora Cedrela glaziovii puberula Citharexylum caudatum Citrus aurantiifolia	Throughout the year
	Citrus medica Codiaeum gossypifolium Crotalaria striata Dillenia indica f Dombeya wallichii Dovyalis hebecarpa Eriobotrya japonica f Erythrina rubrinervia Eucalyptus trachyphloia Euphorbia malaccensis Euphorbia holimianiana Gossypium barbadense Hibiscus esculentus Hibiscus sabdariffa Holmsajolia sanguinea f Ipomoea tiliacea Lasianthus sambac	

Plant	Locality	Collector	Date
<i>Gracilopis</i>	San Rafael de Coronado	San Rafael de Coronado	February
<i>Gracilopis</i>	San Isidro del General	San Isidro del General	February
<i>Gracilopis</i>	San Isidro del General	San Isidro del General	February, March
<i>Gracilopis</i>	San Isidro del General	San Isidro del General	July

Insect and locality	C o l l e c t e d o n	Date and notes
Graptoccephala sexlineata (Sign.)	Acalypha wilkesiana	Hibiscus sandariffa f
Paso Ancho	Acnisthus arborescens	Jasminum sambac
San Isidro de Coronado	Aleurites malaccana	Jasminum simplicifolium f
San Isidro del General	Althaea rosea	Lagenaria leucantha f
	Amaranthus cruentus	Leonurus sibiricus
	Anacardium occidentale	Mangifera indica
	Apeiba tibourbon	Mimosa balata
	Beta vulgaris	Oreopanax sp. f
	Cassia sophora	Persea americana
	Ceiba pentandra	Phaseolus lunatus
	Clerodendron fragrans	Phenax mexicanus f
	Crotalaria spectabilis	Rumex crispus f
	Dahlia sp. (Catalina)	Solanum lanceolatum
	Dombeya wallichii	sinuatum f
	Eriobotrya japonica	Solanum torvum
	Erythrina rubrinervia	Tabebuia guayanae f
	Gomphrena globosa	Tabernaemontana bignoniace-
	Gossypium barbadense	flora
	Helianthus annuus	Tea. r. sie. toribaria f
	Heliotropium peruvianum	Tabebuia pentapaylla
		Verbesina turbacensis f

Protoparce varia (Say)

Alajuela
Garrido

Anacardium rhinocarpus
Euphorbia corollata
Euphorbia corollata
Calyptranthes costaricensis
Cassia alata
Citrus aurantium
Citrus aurantium
Eriobotrya japonica
Erythrina rubicundifolia
Gardenia jasminoides
Hamelia erecta
Impatiens balsamina

Creopanax sp.
Pellaea nemoralis
Persea americana
Rhus glabra
Sambucus mexicana
Sambucus officinarum
Sambucus purpurea
Terminalia catappa
Trichilia hainanensis
Vernonia brachiata
Xanthosoma sagittifolium
Yucca elephantipes

Gypona praeterita Fowl.

Alajuela

January

Gypona puncticollis Scamph.

Gypona signoreti Stål

January

September,
December

Gypona vinula Stål

Tarrazu

Rordia nitis

Cornutia pyramidata
Meibomia sp.

June,
October

Insect and locality	Collected on	Date and notes
<i>Gyrone vulnerata</i> Walk. Alajuela Guadalupe San Jose	<i>Acalypha wilkesiana</i> <i>Anacardium rhinocarpus</i> <i>Annona squamosa</i> <i>Asclepias tuberosa</i> <i>Cajanus bicolor</i> <i>Cydonia oblonga</i> <i>Eugenia malaccensis</i> <i>Gossypium</i> sp. <i>Helianthus annuus</i> <i>Hemerocallis courmaril</i>	<i>Inga rososoviana</i> <i>Persea pittieri</i> <i>Phaseolus vulgaris</i> <i>Psidium molle</i> <i>Rubus</i> sp. (Blackberry) <i>Solanum lanceolatum sinuatum</i> <i>Solanum tuberosum</i> <i>Vernonia brachiata</i>
<i>Homalodisca triquetra</i> (F.) Santa Ana	<i>Calliandra grandiflora</i> <i>Citrus aurantiifolia</i>	<i>Citrus aurantium</i> <i>Mimosa asperata</i>
<i>Kolla fasciata</i> (Walk.) Alajuelita Paso Ancho	<i>Byrsonima crassifolia</i> <i>Calonyction aculeatum</i> <i>Carna indica</i> <i>Clerodendron fragrans</i> <i>Crotalaria striata</i>	<i>Hibiscus sabdariffa</i> <i>Linum usitatissimum</i> <i>Cuminum basilicum</i> <i>Phytolacca octandra</i> <i>Polygonum punctatum</i>
<i>Kolla geometrica</i> (Sim.) Crisi Tarrazu	<i>Asclepias tuberosa</i> <i>Euphorbia frutescens</i>	<i>Coileia arabica</i> <i>Eugenia malaccensis</i>
<i>Neonirvana lyalina</i> Omen Paso Ancho San Pedro	<i>Annona cherimola</i> <i>Citharexylum caudatum</i> <i>Cornutia pyramidalis</i> <i>Hamelia erecta</i>	<i>Hibiscus rosa-sinensis</i> <i>Passiflora ligularis</i> <i>Passiflora foetidisima</i> <i>Trichilia havanensis</i>
<i>Oncometopia anceps</i> Fowl. Waldeck	<i>Paspalum fasciculatum</i>	
<i>Oncometopia obtusa</i> (F.) Guadalupe Paso Ancho San Isidro de Coronado San Jose San Pedro Tarrazu	<i>Acalypha wilkesiana</i> <i>Althea rosea</i> <i>Annona cherimola</i> <i>Elaeagnus bonandrea</i> <i>Byrsonima crassifolia</i> <i>Cajanus bicolor</i> <i>Callistemon lanceolatus</i>	<i>Calyptranthes costaricensis</i> <i>Canarium odoratum</i> <i>Carissa grandiflora</i> <i>Citrus aurantiifolia</i> <i>Citrus limonia</i> <i>Citrus paradisi</i> <i>Citrus sinensis</i>

Insect and Locality	Collected on	Date and time
Cnecometopia undata (F.)	Collaea variegata	f
Alajuelita	Coffee graminea	f
Cartago	Collaea illinoi	f
Paso Ancho	Collaea esculenta	f
Peralta	Crotalaria juncea	f
San Jose	Croton coccypifolius	f
Tarrazu	Diospyros resinoides	f
	Doryalis hebecarpa	f
	Elaeagnus acellata	f
	Erythrina rubrinervia	f
	Eugenia jamaica	f
	Fortunella japonica	f
	Gossypium barbadense	f
	Grevillea robusta	f
	Guarea caoba	f
	Hamelia erecta	f
	Hibiscus esculentus	f
	Hibiscus rosa-sinensis	f
	Hicoria pecan	f
	Impatiens balsamina	f
	Lantana camara	f
	Lonocera japonica	f
	Malus sylvestris	f
	Mangifera indica	f
	Morus rubra	f
	Panicle martinide	f
	Panicum aculeata	f
	Persea americana	f
	Prunus salicina	f
	Prunus communis	f
	Rosa spp.	f
	Rubus spp.	f
	Rumex crispus	f
	Sambucus mexicana	f
	Solanum lanceolatum	f
	Sintanum	f
	Spondias mombin	f
	Spondias purpurea	f
	Sterculia diversifolia	f
	Tabeaia pentaphylla	f
	Terminalia catappa	f
	Thevetia nerifolia	f
	Tournefortia foetidissima	f
	Trichilia havanensis	f
	Veronica brachiata	f
	Xylosma sp.	f
	Zinnia elegans	f
	Inga roussovia	November
	Lippia berlandieri	November
	Mimosa asperata	November
	Psidium friedrichs-	November
	thalianum	November
	Rosa spp.	November
	Terminalia catappa	November
	Trichilia havanensis	November

Insect and locality	C o l l e c t e d o n	Date and notes
Cebornellus mexicanus Obs. San Isidro de Coronado	Acnistus arborescens Bixa orellana Cestrum macrophyllum Cestrum lanatum Citrus nobilis x C. para- disi Conostegia lanceolata Dahlia sp. Datura stramonium Hamelia erecta	Inga roussoviriana Iresine herbsti Mimodes sp. Psidium guajava Prunus cerasifera pissardi Rheum naponticum Solanum tuberosum Ternanthera ricoides Trichilia havanensis Zea mays
Parallaxis calthirata McA. Paso Ancho	Mirabilis jalapa	October
Phera obtusifrons Fowl. Paso Ancho	Coix mayuen Paricum barcinode	Pennisetum purpureum f
Platymetopus frontalis Van D. Alajuelita Pavas de Turrialba San Isidro de Coronado	Amaranthus spinosus Eaulinia monandra Eidens pilosa Elaeoa gracilis Eliothia sapida Eragrostis officinalis Eriodonta davidi Erythronium pinnatum Eyrsonima crassifolia Calanous bicolor Carysanthus sp. Citrus aurantium Citrus limonia Clitoria ternatea Codinaea variegatum	Coffea arabica f Coix mayuen Coleus blumei f Conostegia lanceolata Coronilla pyramidata Crotalaria fulva Crotalaria striata Doxypilis hebecarpa Erythrina rubrinervia f Eugenia maleccensis f Grass Guilielma utilis Helianthus annuus Heliotropium peruvianum f

Thamnotettix fasciaticollis
Stal.

Thamnotettix fasciaticollis
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Passiflora ligularis
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Passiflora ligularis
Passiflora ligularis
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Passiflora ligularis
Passiflora ligularis
Passiflora ligularis

Protaletria decurata (Stal.)
Paso Ancho

Inga rousaviana

February to
September

Protaletria signata McA.
San Pedro

Tabebuia pentaphylla

April, August.
Abundant

Spargiella mexicana Par.
Santa Ana

Ipomoea sp.

July

Stirellus bicolor (Van D.)
Pavas de Turrialba

Grass

February

Thamnotettix comatus (Fall)
Alajuela
Alajuelita
Pavas de Turrialba
San Isidro de Coronado
San Pedro de Barba

Clarendonhron fragrans
Eriobotrya japonica
Grass
Panicum bartinode
Vernonia brachiata

March
July,
September

Thamnotettix fasciaticollis
(Stal.)

Anacardium cruentum
Bankia monandra
Brassica oleracea acephala
Byrsonima crassifolia
Calyptranthes costaricensis
Citrus sinensis
Colocasia esculenta
Cupressus benthami
Dahlia sp. (Catalina)

Fortunella japonica
Impatiens balsamina
Oreopanax sp.
Passiflora ligularis
Persea pittieri
Raphanus sativus
Solanum umbellatum
Pyrus communis
Thunbergia grandiflora

Throughout the
year.

Insect and locality	Collected on	Date and notes
<i>Typhlocybella minima</i> Beek. Paso Ancho	Grass	September
<i>Xestoechelus tessellatus</i> Van D. Paso Ancho Waldeck	<i>Linum usitatissimum</i> <i>Theobroma cacao</i>	July
CICADIDAE <i>Fidicina prona</i> (Walck.) San Isidro del General	<i>Erythrina rubrinervia</i> <i>Gliricidia maculata</i>	February. Abundant
<i>Quesada rufus</i> (Cliv.) San Isidro del General	<i>Cassia spectabilis</i> <i>Gliricidia maculata</i>	February

Insect and Locality	Collected on			
COCCLIDAE				
Aspidiotus destructor Sign. Itz'on Walden	Cocos nucifera Elaeis guineensis Pandanus utilis	f f f	Persea americana	f July, September
Aulacaspis pentagona (Targ.) Guainalape	Avicennia guianensis Millettia roseo-sinensis	f f	Jacobinia aurea Mangifera indica	f f
Aulacaspis rosae (Bouché) Paso Ancho San Jose	Epidendrum spp. Rosa spp.	f f		March, May, July, September
Ceroplastes floridensis Const. Alajuelita Paso Ancho San Isidro de Coronado	Antigonon leptopus Citrus paradisi Eugenia uniflora Gardenia jasminoides Lagerstroemia speciosa	f f f f f	Lucuma muricata Mammea americana Psidium molle Russelia equisetifolius	f f f f
Chrysomphalus dictyospermi (Morg.)	Avicadulus persica Cinnamomum camphora	f f	Citrus mitis	f January
Coccus acuminatus (Sign.) Desamparados de Alajuela	Gardenia jasminoides Conolobus edulis	f f	Jasminum simplicifolium Psidium guajava	f f February to August
Coccus hesperidum L. Ochomogo Santa Ana	Blighia sapida Citrus aurantium Clusea sp. Codiaeum variegatum Dianthus barbatus Eugenia malaccensis Gardenia jasminoides	f f f f f f f f	Iris laevis Mangifera indica Mimusops balata Nephrolepis spp. Rheedia sp. Viola odorata	f f f f f f f f May to September. Tended by Solenop- sis geminata.

Insect and locality	C o l l e c t e d o n	Date and note
<i>Coccus viridis</i> (Green)	Coffee arabica	f
<i>Florinia floriniae</i> (Targ.-Tonn.) San Jose	Cocos nucifera	f
<i>Hemichionaspis aspidistrae</i> (Sign.) Guadalupe Limon Ochozogo Paraiso de Cartago San Isidro de Coronado San Jose		January, February, September
<i>Icerya montserratensis</i> Riley and Howard	Jacaranda ovalifolia	f
<i>Ischnaspis longirostris</i> (Sign.) Guadalupe San Jose	<i>Asparagus sprengeri</i> <i>Chamaedorea bifurcata</i> <i>Cocos nucifera</i>	February, March, June
<i>Lepidosaphes beckii</i> (Newm.) San Isidro del General	<i>Citrus limetta</i>	f
<i>Orthenia insignis</i> Dougl. San Rafael de Coronado	<i>Cestrum nocturnum</i> <i>Carysantheum</i> sp. <i>Clerodendron thomsonae</i> <i>Eugenia jambos</i> <i>Fraxia</i> sp. <i>Gardenia jasminoides</i> <i>Gonolobus edulis</i> <i>Iresine herbsti</i>	f f f f f f f f
	<i>Jacquinia aurea</i> <i>Leucaena canara</i> <i>Lupinus berlandieri</i> <i>Mentha sativa</i> <i>Pandia mitis</i> <i>Rosmarinus officinalis</i> <i>Russelia equisetifolius</i>	Throughout the year

Insect and Locality		Collection		Determination	
<i>Protopulvinaria parviformis</i> Cali. Paso Ancho San Pedro		<i>Eugenia malaccensis</i> <i>Psidium friedrichsthalianum</i>	f f		July, September, October, December
<i>Pseudonidula articulatus</i> Morf. Paso Ancho		<i>Citrus limonia</i> <i>Coffea arabica</i>	f f	<i>Lasminum soniac</i> <i>Tabernaemontana coronaria</i>	f f April, May, September, October
<i>Pseudischraspis bowreji</i> (Cali.) San Jose					
<i>Pseudococcus citri</i> (Risso) Paso Ancho Tarrara		<i>Sambucus mexicana</i> <i>Legenaria leucantha</i>	f f	<i>Sobralia</i> sp.	f July
<i>Pseudococcus longispinus</i> (Targ.) Limon		<i>Caladium bicolor</i>			September
<i>Pseudococcus virgatus</i> (Cali.) Paso Ancho San Jose		<i>Sauhinia violacea</i> <i>Blakea gracilis</i> <i>Eyrsonima crassifolia</i>	f f f	<i>Eugenia uniflora</i> <i>Psidium guajava</i> <i>Serjania</i> sp.	f f f January, February, May, June, August, October
<i>Pulvinaria psidii</i> Mask. Paso Ancho		<i>Acalypha wilkesiana</i> <i>Blighia sapida</i> <i>Eugenia jambos</i> <i>Eugenia malaccensis</i> <i>Gardenia jasminoides</i>	f f f f f	<i>Gonolobus edulis</i> <i>Iresine herbsti</i> <i>Ixora chinensis</i> <i>Pheedia</i> sp. <i>Viola odorata</i>	f f f f f Preyed on by <i>Azya</i> <i>luteipes</i> . Tended by <i>Solenop-</i> <i>sis geminata</i> .
<i>Rhizococcus coffeae</i> Laing Guadalupe					May

Insect and locality	C o l l e c t e d o n			Date and notes
Saissetia hemisphaerica (Targ.)	Acnistus arborescens	f	Iresine herbsti	Tended by Solen-
Ochomogo	Antigonon leptopus	f	Lantana trifolia	opsis geminata.
Sabanilla	Asparagus sprengeri	f	Lucuma mammosa	and Rhipipteryx
San Isidro del General	Eligbia sapida	f	Malus sylvestris	biolleyi Sauss.
San Jose	Calyptanthus costaricensis	f	Miltonia andresi	
	Chalcas exotica	f	Persea pittieri	
	Chrysophyllum cainito	f	Prunus salicina	
	Citrus limetta	f	Psidium friedrich-	
	Citrus paradisi	f	stalianum	
	Clerodendron fragrans	f	Punica granatum	
	Coleus blumei	f	Sanchezia nobilis	
	Colocasia esculenta	f	Spondias mombin	
	Dahlia rosea	f	Spondias purpurea	
	Impatiens balsamina	f	Tabernaemontana bignon	
	Impatiens sultani	f	iaeflora	
		f	Tournefortia foetidissima	
		f	Zinnia elegans	
Saissetia nigra (Wietn.) Faso Ancho	Ocimum basilicum	f		December
Saissetia oleae (Bern.)	Annona cherimola	f	Eugenia malaccensis	Throughout the
	Annona muricata	f	Ficus carica	year. Tended
	Antigonon leptopus	f	Malus sylvestris	by Solenopsis
	Citrus limetta	f	Punica granatum	geminata
	Erythrina rubrinervia	f		
Trionymus sacchari Ckll. Santa Barbara de Heredia				August
FULGORIDAE				
Anotia invalida Fowl. Waldeck	Coix lacryma-jobi		Theobroma cacao	April, July
	Paspalum fasciculatum			Abundant

<i>Delphacodes costalis</i> Fowl. Waldeck	<i>Theotima cuneata</i>	April, July
<i>Delphacodes emirons</i> Wal. Waldeck	<i>Panicum baccinodes</i>	April, July. Abundant
<i>Delphacodes tincalis</i> Fowl. Fowl de Turrialba San Isidro del General Turrialba Waldeck	<i>Cordia veriegata</i> <i>Cordia lacynna-joti</i> <i>Cornutia pyramidata</i> Grass <i>Impatiens balsamina</i>	February, July
<i>Delphacodes proxima</i> (Fowl.) Waldeck	<i>Citharexylum cuneatum</i> <i>Coffea arabica</i>	April, September
<i>Delphacodes irroratus</i> Swartz Crosi	<i>Cupressus benthami</i> <i>Ipomoea purga</i> <i>Ipomoea tiliacea</i> <i>Lantana camara</i>	February, July October
<i>Delphacodes nigrofacies</i> Waldeck	Grass	January
<i>Delphacodes propinqua</i> Fieb. Paso Ancho Pavas de Turrialba	Grass	March
<i>Delphacodes teapae</i> (Fowl.) Paso Ancho	<i>Phaseolus vulgaris</i>	September, December

Insect and locality	C o l l e c t e d o n	Date and notes
Dictyophara florens (Stål) Santa Ana	Leomurus sibericus	July
Dictyophara herbida (Walk.) Paso Ancho Santa Ana Waldeck	Achyranthes aspera Gliricidia maculata Inga roussoviana Panicum barbinode	July, September, December
Dictyophara obtusifrons (Walk.) Paso Ancho San Pedro	Casuarina equisetifolia Cleome spirosa Coix mayuen Hibiscus sabdariffa	July, November, December
Enchophora florens Dist. Santa Ana	Bunchosia costaricensis	July
Flatoides humeralis Walk. Paso Ancho	Amygdalus persica Casimiroa edulis Citrus sinensis	March, June
Oecleus addendus Fowl. Pavas de Turrialba Waldeck	Elaeis guineensis Grass	February, July
Peregrinus maidis (Ashm.) Paso Ancho Waldeck	Coix mayuen	April, October, November
Sogata furcifera Horv. Pavas de Turrialba	Grass Triticum aestivum	February, December

Geographical Distribution

Collection

Notes

Centropus viridissimus Fend.
San Isidro del General

Trochilops viridissimus Stal
San Pedro

GENERALITIES

Aconitophora pallidissima Stal
Alajuelita
Guadalupe
Navarro
San Isidro de Coronado
San Jose
Santa Ana

"Poco"

Centropus rubrinervis

Aconitophora muricata
Cajanus bicolor
Cassia reticulata
Citnarexylum candidum
Elaphrium sinaruba

f f

Centropus acuminatifolia

Eucalyptus trachyphloia
Lucuma mammosa
Prunus armeniaca
Vernonia brachiata

February

September, October

Insect and locality	C o l l e c t e d o n	Date and notes
Acutalis fusconervosa Fairm. Santa Elena de Turrázu	Coffea arabica	January
Aethalion quadratum Fowl. Paso Ancho	Canarium odoratum Sida rhombifolia	f November, December
Aethalion reticulatum (L.) Alajuelita Paso Ancho San Isidro de Coronado	Bombacopsis fendleri Codiaeum variegatum Elaceagnus umbellata Elaphrium simaruba Erythrina crista-galli Erythrina rubrinervia	f Through out the year f f f
Alchisme grossa (Fairm.) La Carpintera San Isidro de Coronado	Acnistus arborescens Cestrum aurantiacum Cestrum lanatum	f January, February, November, Decem- ber f f f
Anastris obtegens (F.)		April
Antianthe expansa (Germ.) Alajuelita Desamparados de Alajuela La Carpintera San Isidro de Coronado San Jose San Rafael de Coronado Santa Rosa Turrázu	Cestrum nocturnum	f Tended by Solano- pis seminata and Parachartergus apicalis (F.)

Insect and Locality	Collection	Plant and Notes
<i>Colletes inaequalis</i> (Fallén). Ala. uellina	<i>Annona caribola</i> <i>Eccremis nervosa</i> <i>Boehmeria violacea</i> <i>C. citrea</i> <i>guianensis</i> <i>Citrus limetta</i> <i>Coina laevigata-jobi</i> <i>Coina acuminata</i> <i>Cydonia oblonga</i> <i>Eucalyptus trachyphloia</i> <i>Eugenia malaccensis</i>	<i>Inga roussoviae</i> <i>Psidium friedrichsthalianum</i> f <i>Spondias purpurea</i> <i>Terminalia catappa</i> <i>Eleocharis nerifolia</i> f <i>Tournefortia foetidissima</i> <i>Cranae micrantha</i> <i>Xylocarpus</i> sp.
<i>Colletes inconspicua</i> Fowl. Crosi Paso Ancho San Pedro	<i>Acnistus arborescens</i> <i>Cassia</i> sp. near <i>alata</i> <i>Inga roussoviae</i> <i>Ixora chinensis</i>	<i>Malpighia glabra</i> <i>Mangifera indica</i> <i>Psidium friedrichsthalianum</i>
<i>Colletes insignis</i> Fowl. Guadalupe La Carpintera Crosi San Isidro del General Waldeck	<i>Anacardium rhinocarpus</i> <i>Annona squamosa</i> <i>Baccharis nervosa</i> <i>Blighia sapida</i> <i>Byrsonima crassifolia</i> <i>Cajanus bicolor</i> <i>Cassia alata</i> <i>Cassia reticulata</i> <i>Citrus medica</i> <i>Clerodendron fragrans</i> <i>Elaphium sinaruba</i> <i>Erythrina rubrinervia</i> <i>Ficus carica</i> <i>Gardenia jasminoides</i> <i>Helianthus annuus</i> <i>Hibiscus rosa-sinensis</i> <i>Hibiscus sabdariffa</i>	<i>Hymenaea courbaril</i> <i>Inga</i> sp. <i>Inga roussoviae</i> <i>Lucuma salecefolia</i> f <i>Piper</i> spp. <i>Poinciana regia</i> <i>Psidium guajava</i> <i>Rosa</i> spp. f <i>Rubus</i> spp. (Blackberry) <i>Rumex crispus</i> <i>Solanum umbellatum</i> <i>Spondias cytheria</i> <i>Spondias mombin</i> <i>Tephrosia toxicaria</i> f <i>Theobroma cacao</i> <i>Verbesina turbacensis</i>

Insect and locality	Collector	Date and notes
Campylocentrus hemifer (Falm.)	Acanthus arborescens	Triumfetta josefina January, September
Campylocentrus pusillus (Malm.)	Acanthus convexities Iborea purga	Melicope s. tiva August, October
Cereca minor Fowl.	Caryophyllus erinito	Vernonia trachata February,
San Isidro del General	Paronychia erectum	Zen. mays April
Santa Ana	Paspalum fasciculatum	
Cereca testacea Falm.	Inga roncevotiana	Prunus salicina December
San Isidro de Coronado	Philadelphus trichopetals	Sterculia diversifolia
Cereca vitellus (F.)	Asparagus conyroides	Colocasia esculenta January
Cyrtodia clavata (F.)	Asparagus cruentus	Pennisetum purpureum
Torito		
Encarnona blinotata (Gay)	Ammonia cnerimola	Fortunella japonica f
Paso Ancho	Antigonon leptopus	Inga laurina
San Isidro de Coronado	Blumea gracilis	Jacobinia aurea
	Byrsonima crassifolia	Jacobinia coccinea
	Ceanothus odoratum f	Lucuma salicifolia
	Carlissa grandiflora	Mangifera indica
	Citrus sinensis	Phyllanthus sp.
	Crotalaria maypurensis	Rosa spp.
	Croton roseipilifolium	Sambucus mexicana
	Dalman rosea	Ruellia amoracia
	Eucalyptus brachyloba?	Solanum seaforthianum
	Eugenia jambos	Spondias purpurea f
		Tephrosia toxicaria f
		Trema micrantha

Plant of Interest	Collector	Plant of Interest	Plant of Interest	Date of Collection
<p><i>Conocarpus allamandensis</i> (Sw.)</p> <p>San Pedro</p> <p>San Pedro</p> <p>San Pedro de Barrios</p> <p>San Pedro del General</p>	<p>Alonso de Ercilla</p> <p>Barros, de Barros</p> <p>Barros, de Barros</p> <p>Barros, de Barros</p> <p>Barros, de Barros</p>	<p><i>Citrus aurantium</i></p> <p><i>Crucifera</i></p> <p><i>Solanum elaeagnifolium</i></p> <p><i>Leucaena leucocephala</i></p> <p><i>Zinnia coccinea</i></p>	<p>Barros, de Barros</p> <p>Barros, de Barros</p> <p>Barros, de Barros</p> <p>Barros, de Barros</p> <p>Barros, de Barros</p>	<p>Barros, de Barros</p>
<p><i>Erythraea limata</i> (F.)</p> <p>San Pedro de Barros</p> <p>San Pedro del General</p> <p>San Pedro</p>	<p><i>Artocarpus elasticus</i></p> <p><i>Bauhinia costaricensis</i></p> <p><i>Myrsine coccinea</i></p> <p><i>Coffea bicolor</i></p> <p><i>Cela myrsina</i></p> <p><i>Cosmos bipinnatus</i></p> <p><i>Crotalaria striata</i></p> <p><i>Eriobotrya japonica</i></p> <p><i>Ficus carica</i></p> <p><i>Ficus religiosa</i></p>	<p><i>Artocarpus elasticus</i></p> <p><i>Bauhinia costaricensis</i></p> <p><i>Myrsine coccinea</i></p> <p><i>Coffea bicolor</i></p> <p><i>Cela myrsina</i></p> <p><i>Cosmos bipinnatus</i></p> <p><i>Crotalaria striata</i></p> <p><i>Eriobotrya japonica</i></p> <p><i>Ficus carica</i></p> <p><i>Ficus religiosa</i></p>	<p>Barros, de Barros</p> <p>Barros, de Barros</p> <p>Barros, de Barros</p> <p>Barros, de Barros</p> <p>Barros, de Barros</p> <p>Barros, de Barros</p> <p>Barros, de Barros</p> <p>Barros, de Barros</p> <p>Barros, de Barros</p> <p>Barros, de Barros</p>	<p>Barros, de Barros</p>
<p><i>Ereantia sallaei</i> (Fowl.)</p> <p>San Pedro</p>	<p><i>Eugenia jambor</i></p> <p><i>Hamelia erecta</i></p> <p><i>Hymenaea courbaril</i></p>	<p><i>Eugenia jambor</i></p> <p><i>Hamelia erecta</i></p> <p><i>Hymenaea courbaril</i></p>	<p>Barros, de Barros</p> <p>Barros, de Barros</p> <p>Barros, de Barros</p>	<p>Barros, de Barros</p>
<p><i>Heteronotus nodosus</i> (Germ.)</p> <p>San Pedro</p> <p>San Pedro</p>	<p><i>Hymenaea courbaril</i></p> <p><i>Inga leptoloba</i></p>	<p><i>Hymenaea courbaril</i></p> <p><i>Inga leptoloba</i></p>	<p>Barros, de Barros</p> <p>Barros, de Barros</p>	<p>Barros, de Barros</p>

Insect and locality	C o l l e c t e d o n	Date and notes
<i>Meriela picta</i> (Coccob.)	<i>Cornutia pyramidalata</i>	April
<i>Hyperaspis cornuta</i> (F.) San Pedro	<i>Eurysonina crassifolia</i>	July
<i>Ischnocentrus niger</i> Stål Peralta	<i>Microtelus</i>	July
<i>Lycoleres parvianus</i> Fowl. San Isidro del General	"Pura"	February
<i>Membracis humilis</i> Fowl. Crosi	<i>Crevillata robusta</i>	November
<i>Leimbacis mexicana</i> Guér. Crosi	<i>Amara sanguosa</i>	Reared by Solen- opsis geminata
San Isidro de Corcosio	<i>Antigonon leptopus</i>	
San Isidro del General	<i>Gambusia purpurea</i>	
San José	<i>Sinox crellana</i>	
Santa Barbara de Haradia	<i>Cajanus bicolor</i>	
	<i>Cassia alata</i>	
	<i>Cassia cochora</i>	
	<i>Cassia spectabilis</i>	
	<i>Cinnamomum camphora</i>	
	<i>Cornutis pyramidalata</i>	
	<i>Dipkysa rotundifolia</i>	f f
	<i>Dombeya wallichii</i>	f f
	<i>Elaeagnus umbellata</i>	
	<i>Eleocharis sinensis</i>	f f
	<i>Eugenia jambos</i>	f f
<i>Microtelus albivittatus</i> Fowl.	<i>Eurysonina crassifolia</i> f	February

Insect and locality	Collected on	Date and notes
Microgaster epaippium (Germ.) La Gloria Peralta San Esteban del General	Acnistus arborescens Annona muricata Apeita tibourbon Capsicum annum	Cenopodium ambrosioides f Panicum maximum
Microgaster laubrina (Stål)	Conostegia macrantha Guarea caoba	Tournefortia foetidissima Vernonia fruticiata
Polyglypta costata Burm. Paso Ancho San Pedro	Annona cherimola f Passiflora ligularis Verbescina turbacensis	Vernonia brachiata
Polyglypta dispar Fowl. La Carpintera	"Parca"	February
Potnia brevicornis Fowl. La Carpintera Paso Ancho	Philadelphus trichopetalus Tournefortia foetidissima	January, February, April, June. Tended by Par- chartergus apicalis
Pterygia bituberculata Fowl. Paso Ancho Santa Ana	Eriobotrya japonica Eugenia jambos Serjania sp.	July, November, December
Pterygia cerviceps Fowl. Waldeck	Theobroma cacao	April
Spongophorus ballista (Germ.) Peralta Santa Ana	Acnistus arborescens Annona cherimola Antigonon leptopus Bauhinia monandra Bauhinia violacea Capsicum annum Cosmos sulphureus	Elaphrium simaruba Grevillea robusta Hibiscus rosa-sinensis Hymenaea courbaril Ipomoea tiliacea Tephrosia toxicaria f Vernonia brachiata

Insect and locality	Collected on	Date and notes
Stictocephalá festina (Say) Alajuelita San Isidro de Corozado San Isidro del General	<i>Porago officinalis</i> <i>Cajanus bicolor</i> <i>Crotalaria fulva</i> <i>Crotalaria retusa</i> <i>Crotalaria striata</i> <i>Helianthus annuus</i> <i>Hibiscus sabdariffa</i>	<i>Linum usitatissimum</i> <i>Meibomia</i> sp. <i>Penicun barbinole</i> <i>Raphanus sativus</i> <i>Saccharum officinarum</i> <i>Vernonia brachiata</i>
Stictopelta acutula (Mirm.)? San Isidro del General San Pedro	<i>Annona muricata</i>	April, July
Tylopelta ribberi (Stål) Paso Ancho San Pedro Ujarras	<i>Meibomia</i> sp. <i>Phaseolus vulgaris</i>	January, February, June, October, December
Antonia crassicornis (Am. ? Serv.) Santa Ana	<i>Acacia costaricensis</i> <i>Acacia farnesiana</i> <i>Cajanus bicolor</i> <i>Cassia sophora</i>	June, September to December
Vapurea segmentata (Serv.)	<i>Acacia farnesiana</i> <i>Cajanus bicolor</i> <i>Calyptranthes coccinea</i> <i>Cassia alata</i> <i>Cassia grandis</i>	January, November, December; Ikenia by Solanopsis geminata

Ant. garie tricolor H. C.

T. unicolor innervia

4

November, December

Insect and Locality	Collected	Remarks
<i>Acanthopneuste griseus</i> Walk. Paso Ancho		Throughout the year
<i>Brachymeria latitans</i> Bates Limon Malbec	<i>Chrysanthemum latitans</i> <i>Coccus nucifera</i> <i>Aspidiotus perniciosus</i>	April, September Very abundant and destructive along entire Atlantic seaboard
<i>Catantopus phyllis</i> L. Paso Ancho San Pedro	<i>Coccinia alata</i> <i>Coccinia reticulata</i>	October, November, January
<i>Corythucha cymatodonta</i> Germ. San Isidro del General	<i>Aspidiotus perniciosus</i> <i>Aspidiotus perniciosus</i>	February, May
<i>Corythucha cymatodonta</i> Germ. Paso Ancho	<i>Phaenocarpa tenuis</i>	December
<i>Corythucha cymatodonta</i> (Woll.) San Pedro		July. Observed flying
<i>Danaus plexippus</i> (Hbn.) San Pedro Torito	<i>Asclepias curassavica</i>	July
<i>Diceromyia albigula</i> (Geyer) Alajuelita	<i>Solanum torvum</i>	January, July
<i>Eristalis pectorator</i> (Fall.) Paso Ancho San Isidro de Coronado	<i>Buddleia axillaris</i> <i>Citrus limetta</i>	Throughout the year

[illegible]

Insect and locality	C o l l e c t e d o n	Date and notes
<i>Hypanartia lethé</i> (F.) San Pedro	<i>Trena micrantha</i>	January
<i>Hyphypena colpoles</i> (Wlsm.) San Josecito	<i>Persea pittieri</i>	Throughout the year
<i>Jocara claudalis</i> Loew. San Isidro de Coronado	<i>Holcus sorghum</i>	January
<i>Lamyra frugiperda</i> (S. & A.) San Isidro de Coronado		September
<i>Leucoptera coffeella</i> (Guer. and Proutt.) Paso Ancho San Josecito		
<i>Licnoptera cavillator</i> Walk. Paso Ancho	<i>Pyris communis</i> <i>Ricinus communis</i>	<i>Taetsia fruticosa</i>
<i>Lyoprep aterrotis</i> (Zool.) (and Hewitt.) San Jose	<i>Ficus carica</i>	August
<i>Melittia curculitae</i> Harr. San Pedro	<i>Cucurbita pepo</i>	May

Insect on which collected	Collector	Locality
<i>Choristoneura brassicae</i> Grav. San Isidro	<i>Bibbers r. maculipennis</i>	San Isidro, February
<i>Choristoneura brassicae</i> Grav.	<i>Massa periclyptus</i>	San Isidro
<i>Phyllorhiza citrus</i> (L.) Paso Ancho San Isidro	<i>Pieris sp.</i> <i>Pieris carolina</i>	San Isidro, December
<i>Phyllorhiza citrus</i> (L.) Paso Ancho	<i>Daucus carota</i>	December
<i>Phyllorhiza polytrichae</i> Stoll E. and J.	<i>Euduleia javitzi</i> <i>Citrus aurantifolia</i> <i>Citrus limonia</i>	July
<i>Phyllorhiza polytrichae</i> Grav. Cachalupe	<i>Aristobolus rigens</i> <i>Lucuma peruviana</i>	June, September
<i>Phyllorhiza polytrichae</i> Grav. Paso Ancho	<i>Jussiaea decurrens</i>	June, July
<i>Pieris elodia</i> Biv. San Isidro de Coronado San Pedro	<i>Brassica oleracea botrytis</i> <i>Brassica oleracea capitata</i> <i>Cleome spinosa</i>	January, April, October
<i>Plutella maculipennis</i> (Curt.) San Isidro de Coronado	<i>Brassica japonica</i> <i>Brassica oleracea acephala</i> <i>Brassica oleracea</i>	January, June, August

Insect and locality	Collected on	Date and notes
Prolimacodes trimaculifera Solano San Pedro	Persea americana f	June
Sibine opheliana Dyar? San Felipe Paso Ancho	Ricinus communis f Solanum wendlandi	June, November
Stenomacra annonella Seng. Paso Ancho	Annona cherimola F	Entire crop of cherimora destroyed.
Stenomacra sororia (Zell.)	Persea littleri f	Throughout the year
Teleonymus rubrus (Stoll) San Pedro	Erythrina rubrinervis f	July to September
Thaumatococcus tibialis Walf. Linon	Terminalia catappa f	September
Tolima celato Dyar San Pedro		April
Utetheisa ornatrix (L.)	Cordia allamanda f Crataegus punctata f Cordia allamanda f	January, February

C R T A O P T I L A

Altenia antea (Sears.)	Acnistus arborescens	Phyllis lagarcae	February, May, July
Paso Ancho	Zulia rosea f	Periploca punctata f	to November
San Isidro del General	Ipomoea tiliacea f	Ruellia amaracis	
San Pedro	Linum usitatissimum f	Scabiosa atropurpurea	
	Lippia berlandieri f	Viola sp.	
	Malacra radiata	Zen mays	
	Passiflora ligularis		

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Pauline von Arnim-Schellin

Efficient

1/ The oviposition slits in bark of trees noted in the Insect Pest Survey Bulletin, vol. 15, Supplement to no. 4, p. 46, under C. rarus Rehn, were probably made by the tetrigonid Erioloides longipennis Rehn. Two females and one male of C. rarus were kept in a tower cage with branches of coffee, avocado, and apple from the last nymphal instar until they died. Copulation took place November 3 and 7, the male died December 9, and the last female died in March. The soil was examined on March 5 and egg clusters were found just below the surface.

Index by Locality Collection Date and Notes

Desera intermedia--Cont'd.	Isanobium spp.	Lycopodium obscurum	f	
	Plantago carolinensis	Malacra palata	f	
	Alseodaphne	Mentha sativa	f	
	Erythrina rubrinervia	Mirabilis jalapa	f	
	Fragaria chiloensis	Nicotiana glauca	f	
	Garcinia tinctoria	Pelargonium graveolens	f	
	Hibiscus erecta	Persea americana	f	
	Impatiens balsamina	Phoenix canariensis	f	
	Indigofera suffruticosa	Polygonum punctatum	f	
	Iponoea purga	Randia mitis	f	
	Iponoea tillicia	Rosmarinus officinalis	f	
	Iresine herbsta	Salvia splendens	f	
	Iris laevigata	Sapium caudatum	f	
	Jacobinia coccinea	Sida rhombifolia	f	
	Jussiaea decurrens	Tagetes patula	f	
	Lactuca sativa	Tagetes orientalis	f	
	Lippia berlandieri	Viola odorata	f	
	Lonicera japonica	Zinnia elegans	f	
Latiblattella sp. Waideck	Theobroma cacao			July
Microcentrum ephippium Burm. San Pedro	Amaranthus spinosus			November
Neoxabea bipunctata (Deg.) Paso Ancho Terrazu	Alnus acuminata Bunchosia costaricensis Coffea arabica Indigofera suffruticosa Melus sylvestris	Musa cavendishi Pelargonium zonale Tournefortia foetidissima Vernonia brachiata		April to December
Orphulella punctata (Deg.) San Pedro	Solanum tuberosum Grass			January

Insect and locality	C o l l e c t e d o n	Date and notes
Panchlora confensis Sauss. Paso Ancho	Guilielma utilis	June, August Household pest
Paratettix mexicana abortus Hancock Alajuelita San Rafael de Coronado Santa Ana	Eidens pilosa Cucurbita pepo Dianthus caryophyllus Fragaria chiloensis Jussiaea decurrens Rubus spp. (Blackberry)	Throughout the year
Parocentanthus mexicanus Sauss. Paso Ancho	Zantedeschia aethiopica	October. In flower
Pyncopelma theodora (Serv.) Tarraza	Coffea arabica	September
Rhipipteryx biolleyi Sauss. Paso Ancho San Isidro de Coronado	Althaea rosea Eligium sapida Byrsonima crassifolia Canarium odoratum Celosia cristata Chrysophyllum cainito Cirsium costaricensis Codium variegatum Coffea arabica Conostegia lanceolata Dianthus caryophyllus Dillenia indica	Throughout the year
Rhipipteryx tricolor Sauss. Juan Vinas Crosi	Asclepias curassavica Grass	February, November
Schistocerca impleta Walk. San Isidro de Coronado San Isidro del General Rancho Redondo	Althaea rosea Annona reticulata Aristolocua rigens Artocarpus communis	Throughout the year
	Baccharis nervosa f Eragrostis oleracea capitata Callistephus chinensis Ceiba pentandra	

Plant and locality	Collected on	Date and notes
<i>Scorobocera impleta</i> —Candl.		
<i>Citrus sinensis</i>	f	<i>Pisum sativum</i>
<i>Cedireum variegatum</i>		<i>Pithecolitium saman</i>
<i>Coix naja</i>		<i>Poinciana regia</i>
<i>Cecropia</i> sp.		<i>Prunus cerasifera</i> pis-
<i>Crotalaria fulva</i>		sardi
<i>Crotalaria striata</i>	f	<i>Palice granatum</i>
<i>Cyperus alternifolius</i>		<i>Rumex indicum</i>
<i>Diplaza robinoides</i>		<i>Rosa</i> spp.
<i>Gomphrena globosa</i>		<i>Rumex crispus</i>
<i>Gossypium barbadense</i>		<i>Saccharum officinarum</i>
<i>Guilielma utilis</i>		<i>Sedum</i> sp.
<i>Helianthus annuus</i>	f	<i>Solanum tuberosum</i>
<i>Heliotropium peruvianum</i>	f	<i>Tephrosia toxicaria</i>
<i>Melinis minutiflora</i>	f	<i>Touja orientalis</i>
<i>Nicotiana tabacum</i>	f	<i>Viola</i> sp.
<i>Pennisetum clandestinum</i>	f	<i>Zinnia elegans</i>
<i>Scopiorus macronatus</i> S. and P. San Pedro		<i>Randia mitis</i>
		November
<i>Stilpnocniflora azteca</i> (Sauss.) Paso Ancho	f	<i>Sapium aucuparium</i>
	f	<i>Trema micrantha</i>
<i>Syntecina tarasca</i> (Sauss.) Guadalupe		<i>Malus sylvestris</i>
Paso Ancho		<i>Manihot esculenta</i>
San Isidro de Coronado		<i>Morus rubra</i>
San Pedro		<i>Pelargonium zonale</i>
	f	<i>Rosa</i> spp.
	f	<i>Trema micrantha</i>
	f	<i>Vernonia brachiata</i>
	f	<i>Zea mays</i>
		January, May, June, July, August, September

Insect and locality	C o l l e c t e d o n		Date and notes
Taeniopoda centurio (Drury) Limon Santa Ana Waldeck	Carludovica palmata Citrus aurantifolia Codiaeum variegatum Nephtrolepis sp.	f f f f	April, May, July, September
Taeniopoda varipennis Rehn Santa Ana	Canna indica Dolichos lablab Hemerocallis fulva	f f f	November

D I P T E R A

Achaetoneura rileyi Will. San Pedro			May. Parasite of Dicentria violascens H.-S.
Anastrepha ludens (Loew) San Jose	Casimiroa edulis	F	April, July. Reared in fruit.

Insect and Locality	Collected on	Date and Notes
<i>Calliphora vicina</i> (F.) Hawaii		July
<i>Chrysomya rufifacies</i> (F.) Hawaii		April, July, December. Reared in fruit.
<i>Carollanella pendula</i> Bezzi		February, August
<i>Zemataxia hominis</i> (L.) Santa Ana		July
<i>Desmometopa n-nigra</i> Zett. San Pedro		February
<i>Dicelacera marginata</i> Macq. San Isidro del General		February
<i>Dilophus melanarius</i> V. de Wulp Paso Ancho San Isidro de Coronado		April, August
<i>Eusimulium callidum</i> D. and S. Paso Ancho		August, September, October Abundant on calf
<i>Eusimulium metallicum</i> (Bell.) La Carpintera Paso Ancho		January, October
<i>Eusimulium quadrivittatum</i> (Loew) Paso Ancho		April
<i>Eutreta sparsa</i> (Wied.) Paso Ancho San Pedro		January, October. Maggots in stalls

Insect and locality	Collected on	Date and notes
<i>Euxesta sororcula</i> Wied. San Pedro	<i>Zea mays</i>	October (Adult only)
<i>Euxesta stigmatias</i> Loew San Isidro del General San Pedro	<i>Zea mays</i>	March, June, September
<i>Rhynchosciara brevicornis</i> Rabbs.? La Carpintera Paso Ancho	<i>Impatiens balsamina</i> <i>Indigofera suffruticosa</i> <i>Trichilia havanensis</i> <i>Vernonia brachiata</i>	
<i>Stenomoxys calcitrans</i> (L). San Pedro		August, September
<i>Stratiomyia subalba</i> Bellardi Paso Ancho	<i>Inga rousseoviana</i>	October
<i>Tetraevaresta obscuriventris</i> (Loew) Cartago Paso Ancho	<i>Amaranthus spinosus</i> <i>Calea urticifolia axillaris</i> <i>Galyptanthes costaricensis</i> <i>Maliscus rosa-sinensis</i> <i>Ixora chinensis</i>	February to July Psidium friedrichsthalianum Scaevola purpurea Terminalia catappa Vincetoxicum
<i>Toxotrypana curvicauda</i> Gerst. Atenas San Pedro	<i>Gonolobus edulis</i>	August. Reared in fruit. September
<i>Volucella purpurifera</i> Bigot Paso Ancho	<i>Philadelphus trichapetalus</i>	September. Eating pollen from P. trichapetalus.
<i>Volucella trilineata</i> Bigot Paso Ancho	<i>Philadelphus trichapetalus</i>	September. Eats pollen.

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Triglyc.

Conthus ephippiatus Say

Rancho Recondo

Bombus mexicanus Cress.

San Pedro

Gymnopolybia sulfureoïasciata

Ducke

Paso Ancho

Soia

Walden

Megachile zapoteka Cress.

San Pedro

Trioliua pratense

1
2
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Leclunus sibericus

Acnistus arborescens

Foenneria nivea

Canangium odoratum

Cestrum lanatum

Cirsium costaricensis

Congea velutina

Rose

Donbeya wallichii

Grevillea banksi

Grevillea robusta

Persea pittieri

Theobroma cacao

Hedychium coronarium

April. Serious injury to a few plants by cutting the leaves.

Insect and locality	Collected on	Date and notes
<i>Odontomachus haematoda</i> (L.) San Pedro	<i>Persea americana</i>	October
<i>Polybia fasciata</i> Sauss. Paso Ancho	<i>Cleome spinosa</i>	April. Eating <i>Pieris clodia</i> Edv.
<i>Solenopsis geminata</i> (F.) San Isidro del General	<i>Ananas sativus</i>	
Santa Ana	<i>Casimiroa edulis</i>	f f
Tarrazu	<i>Cassia alata</i>	f f
Turrialba	<i>Citrus limetta</i>	f f
	<i>Citrus paradisi</i>	f f
<i>Tatua tatua</i> (Cuvier) Paso Ancho	<i>Dovyalis hebecarpa</i>	August
	<i>Impatiens balsamina</i>	
<i>Trigona amalthea</i> (Oliv.) Santa Barbara de Heredia	<i>Zea mays</i>	August taking pollen.
<i>Trigona cupira</i> Smith Paso Ancho	<i>Bocconia frutescens</i>	June, August, Octo- ber. Feeds in flower.
	<i>Calonyction aculeatum</i>	
	<i>Coriandrum sativum</i>	
<i>Trigona ruficrus corvina</i> Cr. Waldeck	<i>Theobroma cacao</i>	April. Eats leaves and pods of cacao
San Isidro del General		
<i>Trigona silvestriana</i> Vachal Crosi	<i>Cassia</i> sp. near <i>alata</i>	February, July,
Ujarras	<i>Citrus paradisi</i>	November. Scallops
Waldeck	<i>Citrus sinensis</i>	the leaves and
	<i>Eucharis</i> sp.	eats flowers.
<i>Tripoxylon rugifrons</i> Cameron Paso Ancho	<i>Conostegia lanceolata</i>	April
<i>Xylocopa frontalis</i> (Oliv.) San Isidro del General	<i>Gliricidia maculata</i>	February; abundant at flowers

Insect and Plant Life

Collected by

Date

MEYSALEPTERA

Diastereus subtilis H. O.	Proctos bonariensis	September
Diastereus subtilis H. O.	Allium coccineum	January to June; October, November. Injurious

ISCPTERA

Kaloterpes fulvipes (Banks)		March to July. Attached principal building of Escuela Nacional de Agri- cultura.
Kaloterpes costalis (Hölm.)	Elaeis guineensis	

DERMAPTERA

Doru lineare (Esch.)	Bixa orellana	February,
San Isidro del General	Grass	July,
San Pedro	Mentha sativa	August
Santa Ana		
Metrosura ruficeps (Burm.)	Musa paradisiaca	
Guadalupe		

Insect and locality	Collected on	Date and notes
<i>Psalis americana</i> (Peavv.) Guadalupe	Musa paradisica	January
MALLOPHAGA		
<i>Eovicola caprae</i> Gult San Pedro	Goat	February, August. A common pest of goat.
<i>Goniodes dissimilis</i> Nitz. San Pedro	Chicken	May
<i>Goniodes meleagridis</i> L. San Pedro	Turkey	December
CERCOENTOMIA		
<i>Aesc. flavatus</i> Davis Guadalupe La Carpintera San Isidro de Coronado	Citrus sinensis Coffea arabica Persea americana Piper aritum	February, May, December
SIPHONAPTERA		
<i>Xenopsylla cheopis</i> (Rothsch.) San Pedro	Rat	June

Insect and locality	Collection	Date and notes
Amyranthus clerici WGP. San Pedro	ARACHNIDA	Citrus sinensis
		f
Tetranychus telarius (L.) (Eotetranychus althaeae var. H.) San Pedro	Chrysophyllum cainito Citrus aurantium	Citrus sinensis
		f
Coffea arabica		March
January, March April. Checks growing and prevents budding of young stock.	Citrus sinensis	f

INSECT PEST SURVEY BULLETIN

Vol. 17

Summary for 1937

No. 10

INTRODUCTION

The winter of 1936-37 resembled the preceding year in spectacular weather. December was wet and warm. In January extremes in temperature occurred in different sections of the country, being from 10° to 14° above normal east of the Mississippi River and from 10° to 20° colder than normal in the West. The month was abnormally wet over the eastern half of the country, the heavier rains culminating in the Ohio Valley, whereas it was relatively dry in the West, except in the Great Basin and in central California.

February weather, as a whole, registered near normal, being a little warm in the Lake Region and the Northeast and a little colder than normal in the West. Precipitation was abnormally heavy from the Rocky Mountains westward and in North Dakota, South Dakota, Minnesota, Wisconsin, and the extreme Southeast; elsewhere the rainfall was deficient. In March the situation in regard to temperature was reversed but rainfall continued the same, being abundant in the West and deficient in the East.

Temperature in April averaged remarkably near normal everywhere. Precipitation was above normal generally in the East and in the far Northwest, while a large area in the Southwest and much of the western plains had very little rain.

May as a whole was warmer than usual, but in the Ohio Valley and the Lake States the weather was abnormally cold, which, accompanied by rainfall, had an important bearing on insect abundance in these areas. Rainfall was below normal over much of the country, although some scattered States had more than normal.

In June the weather was decidedly cool during the first half and abnormally warm the latter half. Rainfall was above normal generally in most sections.

July had moderate temperatures over the Southern and Eastern States, abnormally warm weather in Central and northern Midwestern States. The rainfall was variable, with a tendency to dryness generally east of the Rockies but comparatively heavy from eastern Montana and Wyoming southwestward, where in some localities it was four times the normal amount.

August was abnormally warm except in the Pacific Northwest, where it was 2° cooler than normal. Precipitation was from moderate to heavy over much of the eastern part of the country, although there were local areas where rainfall was deficient, especially in the central part of the Mississippi Valley and the western part of the Ohio Valley. Rainfall was markedly deficient in most parts from the central and southwestern Great Plains to the Pacific, but in the Pacific Northwest it was well above normal.

September and October were cooler than normal east of the Mississippi Valley, particularly in the Ohio Valley and some Middle Atlantic sections, while it was warmer than usual generally west of the Mississippi. Precipitation in September was variable, being excessive in some places and deficient in others. Precipitation in October was heavy east of the Mississippi, some sections having from two to three times the normal amount. West of the Mississippi the distribution of rainfall was irregular, with a general tendency to dryness.

The effect of climatic conditions on insect development became evident the middle of December, when the fall cankerworm was observed mating on Long Island. Other examples of occurrences somewhat spectacular, although of no real importance, were grasshoppers hopping about in New Hampshire the third week in February, activity of moths in the northeastern part of the country all winter during the milder periods, and the hatching of eggs of the eastern tent caterpillar in southeastern New York late in February. In the Southern States many species of insects continued uninterrupted reproduction and others came out of hibernation and fed from time to time. The tomato pinworm passed the winter out of doors in the Philadelphia area; however, there were no reports of infestation in the summer.

The cool, rainy weather in April and May had an important effect on abundance of the chinch bug in the eastern part of its range. Emergence from hibernation was delayed and when the bugs came out they either died or failed to reproduce to any great extent. In the western part of their range, however, the weather was drier and damage was caused in some localities. Weather conditions late in the summer and fall

were favorable to a decided recovery of chinch bug populations from the spring set-back.

On the whole, grasshoppers were favored, by the weather. Although the cool, rainy spring in some parts of the infested area prolonged the hatching period and retarded nymphal development, it also interfered with the baiting program. Severe infestations occurred in all of the infested area. Rainfall during the summer was sufficient to produce more ample vegetation than in the preceding dry years; consequently, the effect of grasshopper feeding on crops was, in general, less concentrated and less severe. Abundant food, together with the unusual warmth from late in the summer until late in the fall, prolonged grasshopper activities and enabled Melanoplus mexicanus Sauss. to produce a partial second generation in the West Central and Rocky Mountain States. The eggs laid by this generation materially increased the population in prospect for 1938.

INSECT PESTS

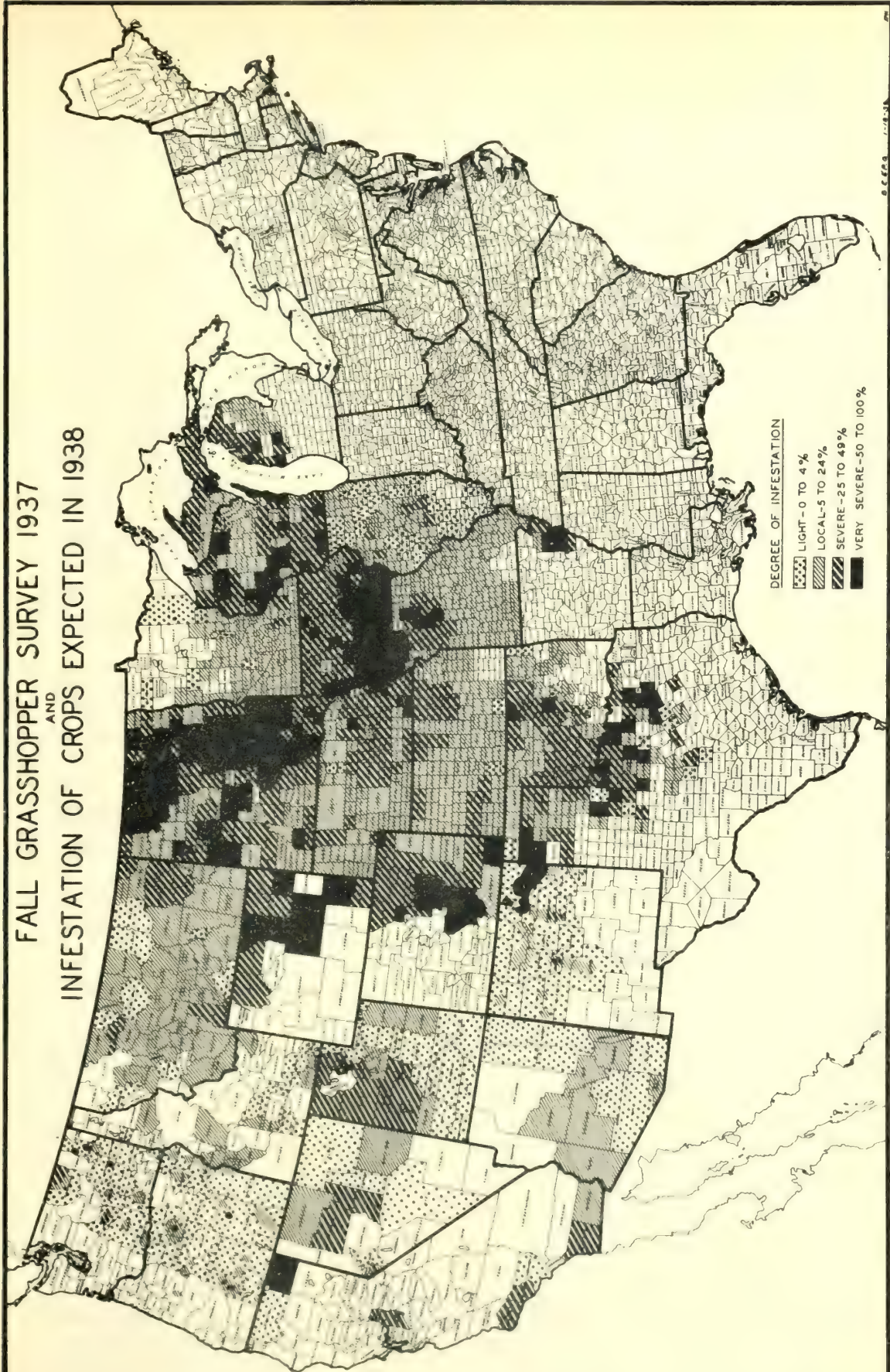
GRASSHOPPERS

In Michigan, Illinois, Missouri, Arkansas, and Texas and in all of the States west of these, grasshopper infestations were from light to very severe during the summer. The most severe and widespread damage was done to small grains in eight counties in the northeastern quarter of South Dakota and to crop and range grasses throughout the southeastern quarter of Colorado. Severe damage was done to cotton in Texas and Oklahoma, and spotted but severe injury occurred in corn, alfalfa, and small grains in other States. Over the entire area the total crop loss was between one-half and one-third of the loss in 1936. A few States outside of this area, including Indiana, Tennessee, Alabama, Mississippi, and Florida, reported increased numbers of grasshoppers or minor outbreaks.

In the great spring- and winter-sheat areas of the Plains States Melanoplus mexicanus Sauss. was by far the most important species. In areas of greater rainfall, in the Corn Belt, and where farming is more diversified, other species such as M. differentialis Thos., M. bivittatus Say, and M. femur-rubrum Deg., equalled or outnumbered M. mexicanus in many places. Camptula pellucida Scudd. was dominant in northern Michigan and Wisconsin and in parts of Oregon and California. In many parts of the area M. packardii Scudd. was also recorded as being numerous and important. For the first time in history, M. differentialis was dominant in Richland County, in the eastern part of Montana. Before 1932 there had been no record of this species in the State. It spread from the southwestern quarter of North Dakota east of the Badlands, where it was numerous in 1931, 1932, and 1933.

Another important feature of the outbreaks during the last 15 years has been the increase in numbers and importance of M. femur-rubrum in practically all of the States and the development of this species in a specific area embracing north-central and northeastern Iowa, south-central and southeastern Minnesota, the southern half of Wisconsin, and part of northern Illinois. A spectacular feature was the outbreak of Dissosteira longipennis Thos. in southeastern Colorado, the extreme western part of Kansas, the Panhandle of Oklahoma, the northwestern counties of the Panhandle of Texas, and the extreme northeastern counties of New Mexico. This year occurred the worst outbreak in the history of the area and the almost complete destruction of small grains by M. mexicanus in the eight counties in northeastern South Dakota, after the fall survey in 1936 had indicated that there would be little trouble from grasshoppers in 1937. If more stops had been

FALL GRASSHOPPER SURVEY 1937 AND INFESTATION OF CROPS EXPECTED IN 1938



COUNTY OUTLINE MAP OF THE UNITED STATES



made in each of these counties during the survey the scattered but dense infestations would no doubt have been picked up.

There was some hatching of M. mexicanus and M. bivittatus before May 1, and as early as February 15 in southern Arizona. In many areas spring rains and cool weather delayed hatching from 2 to 3 weeks. M. differentialis and M. femur-rubrum were from 2 to 3 weeks later in hatching than were M. mexicanus and M. bivittatus. Over the entire area the hatching of eggs of several species was prolonged in many localities up to the middle of July or the first of August. In Colorado and elsewhere D. longipennis started hatching the second week in May. Late hatching of some species in parts of the area delayed the necessity of control campaigns into the latter part of July. This was caused by cool rainy weather in June and July. Ninety percent of the poisoned bait used in Minnesota was put out after July 26. Over the entire area early rains delayed grasshopper activity. In general, first injury began after the middle of May and the worst damage occurred in June to small grains and to alfalfa after the first cutting, also to seedling alfalfa. Damage to corn came later in July.

A nymphal survey in May and June showed newly hatched nymphs to be congregated in restricted areas. On the range in Colorado the third week of May, D. longipennis was in areas of 40 to 320 acres, at the rate of from 50 to 500 hoppers per square foot. They were in the first instar and were already migrating and spreading. The last week of May heavy concentrations of M. mexicanus and M. bivittatus occurred in alfalfa, draws, pasture, creek bottoms, stubble, and field margins. Some of these concentrations ran from 300 to 500 per square yard. At this time there had been no general movement of these species to other crops from the breeding grounds. In South Dakota only 1 out of 5 to 10 fields near Huron were at first involved, because the infestations were spotted. At the beginning well-tilled fields were free from hoppers. These spotted infestations were so dense that their spread took in a wide area adjacent to their original hatching ground. One quarter-section of seedling alfalfa in this area had a population of 250 per square yard all over the field. This infestation alone could have taken all of the grain in 8 or 10 sections.

In both the Huron and Winner areas of South Dakota many of the grassy headlands suitable for egg deposition of M. differentialis and M. bivittatus had been covered by blown soil and changed to hummocks of sandy loam, covered with Russian-thistle, a condition well suited for egg deposition by M. mexicanus, and in these places this species hatched in considerable numbers. An environment suitable to certain species had been changed to one suitable to another species. Most of the grain fields destroyed in the eight counties in South Dakota started blowing as soon as the hoppers had taken off the grain.

A period of cold rainy weather during the first 3 weeks of June retarded nymphal development and in northern Iowa, northern Montana, northern and northeastern Wyoming, and elsewhere destroyed from 25 to 50 percent of the newly hatched nymphs. It also delayed and seriously interfered with the baiting programs. Prolonged hatching aggravates the situation by increasing the number of applications necessary. In some instances first-instar hoppers of M. mexicanus were found together in the same field with the gravid females.

The first record of adults was from southwestern Oklahoma, where 50 percent of the M. mexicanus were adult by May 22. Oviposition started July 1, which permitted a second generation of this species to begin hatching on July 20, with adults appearing again on September 1. Egg deposition by this second generation began on September 20 and continued into November. In South Dakota, Nebraska, Kansas, Oklahoma, Missouri, and Iowa, this second generation occurred at the rate of 15 to 100 per square yard in alfalfa and stubble and along field margins. These infestations actually developed into secondary outbreaks, being especially injurious to winter wheat and necessitating control measures to protect crops.

By June 20 there were a few adults of M. bivittatus together with all instars, but M. differentialis and M. femur-rubrum were still in the first three instars. M. bivittatus started ovipositing after July 15 and M. differentialis about September 1. From then on until the middle of November there was an almost unbroken favorable period for egg deposition in most of the grasshopper area. There was also plenty of green food for the development of eggs within the females. During the summer there were fewer flights recorded than in 1936, which was probably due to the cooler weather and better food conditions. In the D. longipennis areas this species was migrating by foot or wing from hatching until the females had settled down to egg deposition. This involved some 3 or 4 million acres in Colorado alone. M. mexicanus spread over 33 counties east of the Missouri River in South Dakota from the 3 counties and local infestations; however, most of the migrations were from breeding grounds to adjacent crop.

Generally speaking, disease, parasites, and egg predators did not reduce populations to any great degree during the summer. In some areas sarcophagid flies were a minor factor. During the egg survey bee fly, blister beetle, and carabid larvae were numerous, attacking from 40 to 70 percent of the egg pods in some places in Missouri, Iowa, and Minnesota. Fungus disease occurred only occasionally.

Eggs of all species were, in general, easily found and were well distributed over the entire area last fall. In Montana, Wyoming, Illinois, Kansas, and Nebraska infestations are equal to or slightly less than last year. In many of the other States infestations are

more widespread and more severe than they have been for several years. They have increased in northern Michigan, throughout Wisconsin, and in the southern half of Minnesota. The most severe infestations were found in Iowa, in northern Missouri, and east of the Missouri River in North Dakota and South Dakota. Egg pods of M. differentialis numbered from 25 to 100 per square foot in many places in Iowa and Missouri.

One of the most startling facts was the finding of egg pods, mostly M. mexicanus, at every one of 266 stops made in 33 counties east of the Missouri River in South Dakota. At 264 stops 5 square-foot samples were taken from within the field, or 1,320 square-foot samples altogether. Egg pods were found in 1,238 of them, or 15 out of 16 square-foot samples contained egg pods. M. femur-rubrum ran from 4 or 5 pods per square foot in upland pastures to 6 or 8 in the bottomlands in southern Wisconsin.

Infestations are higher in the delta country of Arkansas, over most of Oklahoma, and in 60 to 80 counties in northwestern, northern, and central Texas. In northeastern New Mexico there are 400 or 500 egg beds of D. longipennis from 4 to 10 acres in size, with pods numbering 8 to 30 per square foot. The average infestation in Arizona is about the same as last year, although there have been shifts within the State.

In Colorado D. longipennis still commands the most interest. Last spring it was estimated that 3,400,000 acres in 8 counties were infested at hatching time. This fall it is estimated that there are 4,025,760 acres of breeding areas in 12 counties, only 4 of which were included in last year's egg beds. There are 8 new counties having infestations of D. longipennis and 4 of the counties infested last year are not listed this year. This was due to the great migrations of adults and the infested area is almost directly west of where D. longipennis hatched last spring. Other species are also abundant in the irrigated sections of the State.

Areas in Colorado infested with D. longipennis

County	1937	Acreage	County	1938	Acreage
Baca-----	:	700,000	Elbert-----	:	207,360
Bent-----	:	100,000	El Paso-----	:	768,000
Cheyenne-----	:	300,000	Pueblo-----	:	640,000
Kiowa-----	:	300,000	Huerfano-----	:	640,000
Kit Carson-----	:	100,000	Las Animas-----	:	1,000,000
Las Animas-----	:	1,000,000	Kiowa-----	:	64,000
Lincoln-----	:	800,000	Lincoln-----	:	256,000
Prowers-----	:	100,000	Crowley-----	:	134,000
:	:		Otero-----	:	250,000
:	:		Fremont-----	:	64,000
:	:		Custer-----	:	32,000
:	:		Bent-----	:	25,000
Total-----	:	3,400,000	Total-----	:	4,025,760

The adult grasshopper survey indicates that there will be some outbreaks in Idaho, Utah, and Washington. Grasshoppers are on the increase in widely separated parts of Oregon threatening serious damage in 1938. The egg survey in California indicated a material reduction of grasshoppers for the State as a whole from the numbers prevailing last year. Parasites have taken considerable toll of the grasshopper eggs.

Last summer and fall 80,000 tons of bait were used in all the States for grasshopper control. All indications from the fall survey point to the fact that there will be needed twice that much to protect crops from hoppers in all the States in 1938. (R. L. Shotwell, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

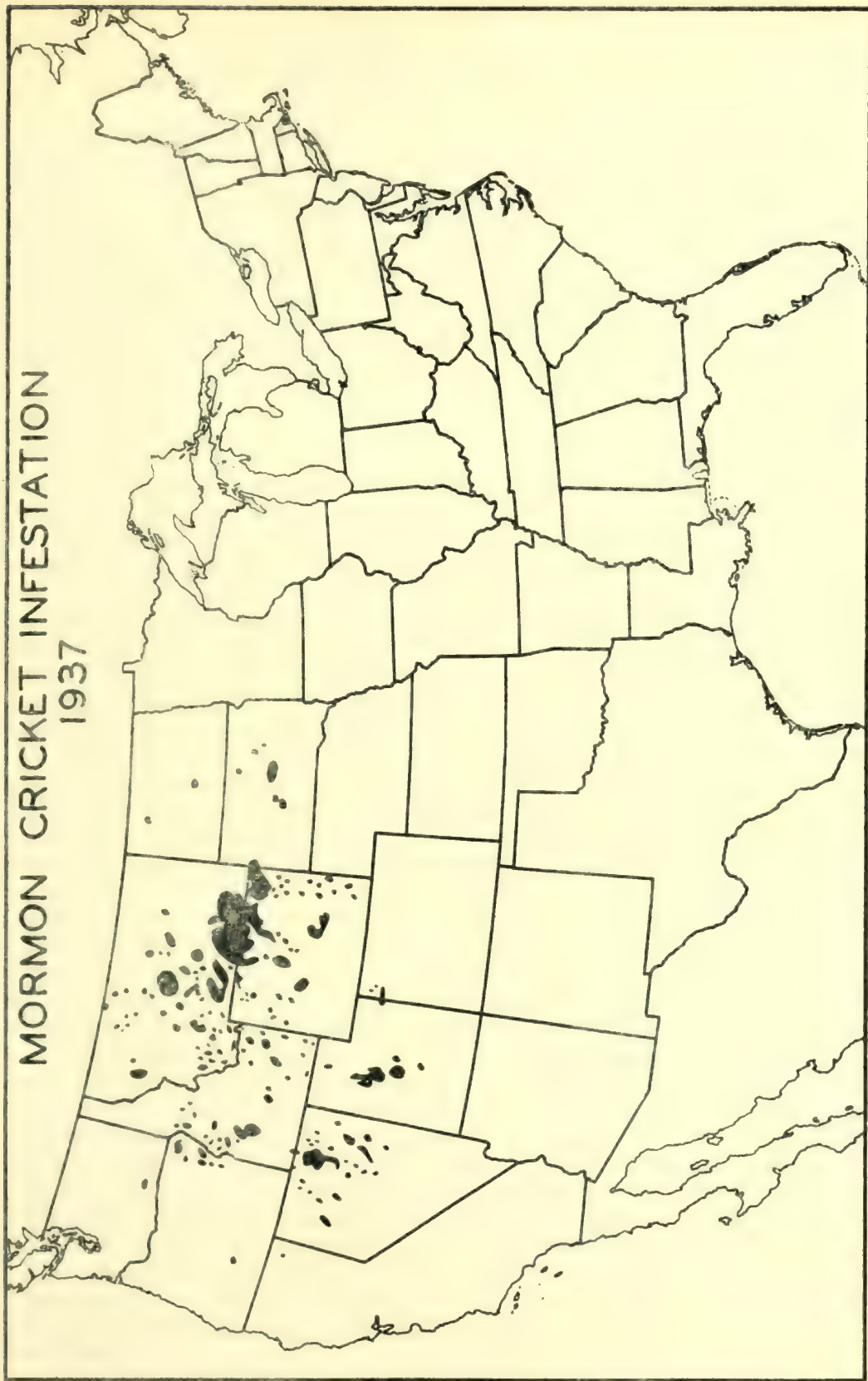
MORMON CRICKET

Mormon cricket infestations were reported for 1937 from 11 States, with a total of 19,273,242 acres in 105 counties, as follows:

State	: Counties : Acres infested	
	: Number	: Acres
California-----	1	?
Colorado-----	2	522,000
Idaho-----	17	1,046,229
Montana-----	39	7,487,695
North Dakota-----	5	?
Nevada-----	6	1,145,000
Oregon-----	3	230,000
South Dakota-----	9	5,700,000 ?
Utah-----	6	640,000
Washington-----	3	252,500
Wyoming-----	14	2,250,000
Total-----	105	19,273,424

Montana, with 39 infested counties out of a total of 56, showed the largest increase over 1936, but the 1937 outbreak in Wyoming was much more severe than that of 1936. Definite decreases in the size and intensity of outbreaks were noted in Colorado and eastern Idaho. Crickets were reported as doing damage to crops for the first time in North Dakota and South Dakota. These outbreaks are widely scattered at present and, although not serious now, may develop into serious proportions unless steps are taken to control them. In the remaining States that showed infestations in 1936 little or no change was noted in the size of the infestations, although the intensity was decreased somewhat in most States. No definite information was received from California this year, but it is understood

MORMON CRICKET INFESTATION
1937



BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE



that crickets were present again in small numbers in Modoc County.

Crop losses were reported as follows: Idaho, slight; North Dakota, slight; Montana, \$500,550; Oregon, \$4,350; South Dakota, slight; Utah, \$10,000; Washington, \$50; Wyoming, \$250,873; making a total of \$898,621. Campaigns were conducted in Colorado, Montana, Oregon, Utah, Washington, and Wyoming under the direction of the Bureau of Entomology and Plant Quarantine and the cooperating States. State W. P. A. control projects were carried on in Idaho and Nevada. Reports from the 9 States indicate that it will be necessary to treat 454,500 "cricket acres" in 1938 in order to save crops. (F. T. Cowan, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

CHINCH BUG

Hibernating chinch bugs were present in moderate to very abundant numbers during the winter and spring of 1937 in an area extending from southeastern Nebraska and eastern Kansas, south to the Kansas-Oklahoma line, across southern Iowa and northern Missouri and the central part of Illinois into western Indiana. A generally lighter infested region extended around this area and included northeastern Oklahoma, southern Missouri, eastern Kansas, south-central Iowa, most of Illinois except the extreme northern and southern parts of the State, Indiana except the extreme southern part, and two-thirds of Ohio in the northwestern and central parts of the State. The extreme southern end of Michigan also came within this lighter infested area. Over most of this area winter mortality was more nearly normal, as opposed to the unusual, heavy mortality during the winter of 1935-36. However, a heavy winter mortality in southern Iowa was reported, which largely removed the rather threatening infestation in that area. Over most of the area spring was cool and wet, resulting in a gradual and delayed emergence from winter hibernation. This belated emergence, combined with the heavy rains in June and July, reduced the expected, rather generally moderate-to-heavy infestation to local, spotted outbreaks. The June and July rains were of more general distribution in most of Indiana and Ohio, therefore the infestation was reduced to a minimum in three States. Farther west from Illinois, across southern Iowa and Missouri into eastern Kansas and Oklahoma, the spring and summer rains were local. This caused some moderate-to-heavy infestation and corresponding injury to small grains and adjacent corn by the first-brood nymphs. These outbreaks were very spotted and local, covering in some cases half a county. Considerable damage by first-brood bugs was also reported from the north-central part of South Carolina and several localities in central and southern Mississippi. In most of the infested area the weather in late summer and fall was dry and favorable to the development of the second brood. This comeback of the second brood over much of the area resulted in some local damage to corn.

The extent of the moderate-to-heavy infested chinch bug area

seems, from available reports, to be from western Indiana across central Illinois, with the more generally and heavily infested area occupying the central part of the latter State, the southern two tiers of counties in Iowa, most of the northern part of Missouri, southeastern Nebraska, eastern Kansas and northeastern Oklahoma. There is some westward extension of the infested area in Kansas and southwest into central Oklahoma. There is a general increase in abundance of chinch bugs, especially in Oklahoma, where both the intensity and extent of the infestation is the most severe in several years. The infestation throughout most of the entire area is very spotted. This indicates the possibility of spotted local moderate-to-severe outbreaks occurring over the area, in case of favorable weather during the spring of 1938, with restricted slight-to-moderate outbreaks in case of unfavorable weather. This survey is based principally on data supplied by the State entomologists of the States concerned, and on supplementary data from the stations of the Bureau of Entomology and Plant Quarantine in the States. (C. Benton, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

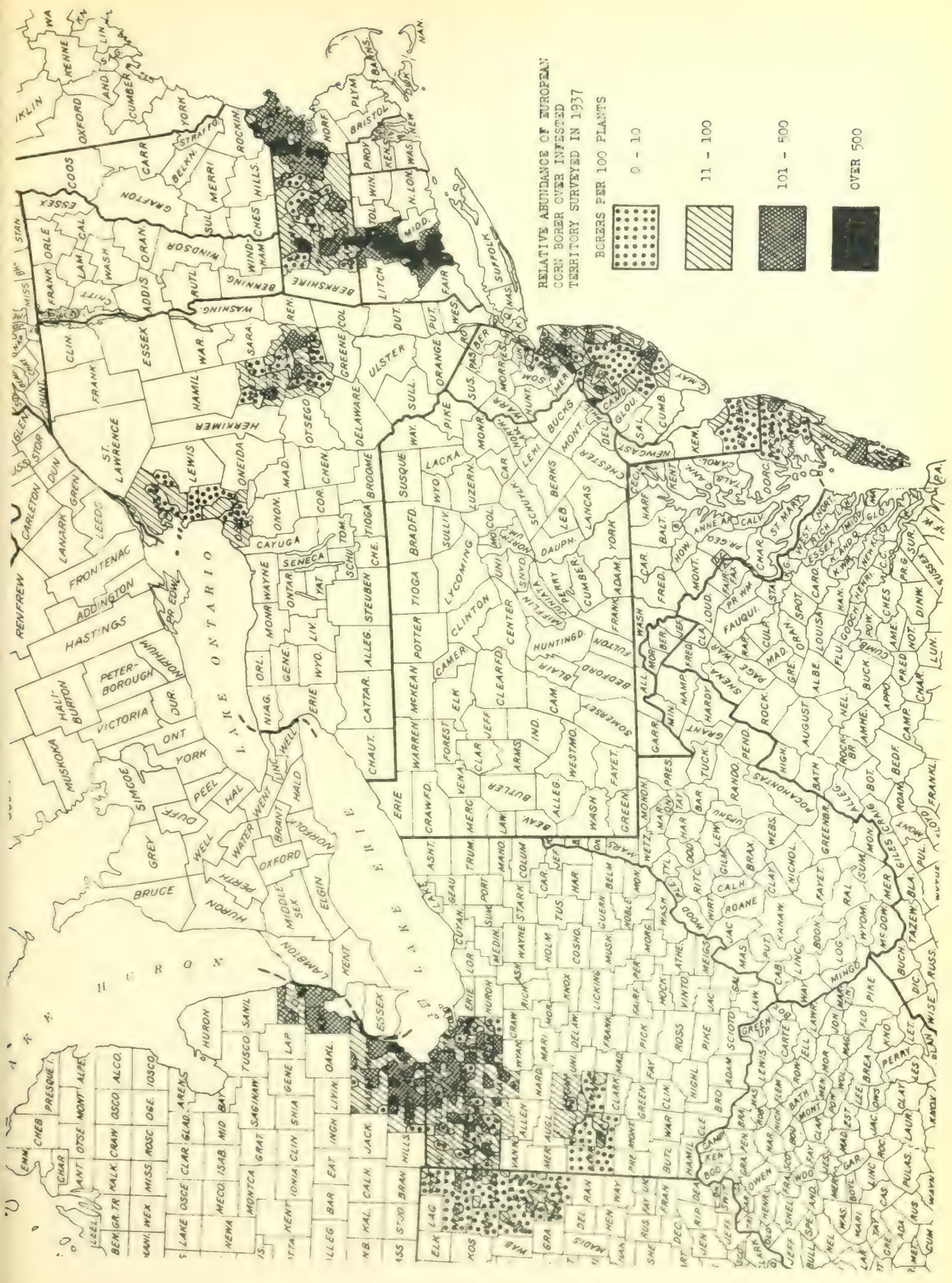
HESSIAN FLY

At harvest time infestations were extremely light in Nebraska, Kansas, and Oklahoma, and practically no material damage occurred. The same was generally true of Iowa, except the northeastern part, and of Missouri, northern Illinois, central and northeastern Indiana, Ohio, Kentucky, Tennessee, western and central Pennsylvania, Maryland, Delaware, Virginia, and North Carolina. In these States, however, certain scattered fields contained enough infestation to be a possible source of local trouble in the fall of 1937. The fly was unusually abundant in some of the more northern parts of its range, including northeastern Iowa, southern Wisconsin, and south-central Michigan. Other areas containing moderate-to-severe infestation, in which there was real danger of an outbreak if weather should favor fly activity, were southern Illinois, northwestern and southern Indiana, and southeastern Pennsylvania.

There was some volunteer wheat in southeastern Pennsylvania and southern Missouri, in which small supplementary broods of fly developed and emerged to infest sown wheat. Throughout the remainder of the area under consideration there was not much growth of volunteer, owing to unfavorable weather.

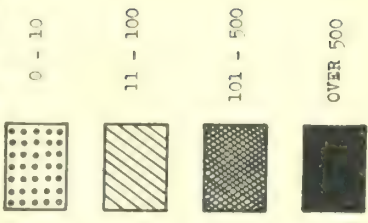
In Nebraska, Kansas, Missouri, north of the Missouri River, and Oklahoma fall infestations appeared to be generally light and scattered. In eastern Pennsylvania, northwestern Ohio, Iowa, and in Missouri south of the Missouri River, the fly seems to be increasing in abundance.

More than the usual amount of early sowing was done in



RELATIVE ABUNDANCE OF EUROPEAN
CORN BORER OVER INFESTED
TERRITORY SURVEYED IN 1937

BORES PER 100 PLANTS





eastern Pennsylvania, Ohio, southern Michigan, central and northern Indiana, western Illinois, and southern Missouri. Some of these early sown fields show infestations ranging from 20 to 100 percent of the plants. In most cases this does not indicate a really serious situation and damage will probably be restricted to local areas. (W. B. Noble, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

EUROPEAN CORN BORER

Comparative data on the abundance of the European corn borer in 1937 in different sections of the area infested were obtained in a survey conducted from August 16 to October 1. In the surveyed portions of Michigan, Indiana, and Ohio, the borer was as generally distributed and as abundant in 1937 as in any previous year of record. Within the territory surveyed in these States in 1937, comprised of 18 counties and 4 county groups, there were 9 counties and 3 county groups in which populations increased significantly from 1936 to 1937, and 9 counties and 1 county group in which the abundance of the borer changed little in the same 2 years. Significant decreases were absent. Damage to early sweet corn grown near Toledo, Ohio, in 1937 reached economic importance.

Although the weather of the 1937 season in the surveyed parts of the above region was considered generally more favorable to the European corn borer than that of any recent year, its effects were offset to some extent by the prevalence of late corn and by severe rain and wind storms in some sections at crucial periods of larval establishment. In New York there was a decrease in abundance in 1937 over that of 1936 in the Jefferson-Oswego County group, whereas in the Albany district approximately the same number of borers were present in 1937 as were found in the last survey, made in 1935.

Along the Atlantic Coast, the borer increased in abundance in 1937 over 1936 in a portion of eastern Massachusetts, in central Connecticut, in southeastern New Jersey, in southern Delaware, and on the Eastern Shore of Maryland and Virginia. The only exception to an increase or tendency in that direction was in western Massachusetts, where a significant decrease in borer population was shown by the survey. The heaviest populations found in 1937, or in any other year of survey in the United States, occurred in Hartford and New Haven Counties, Conn. The general increase in abundance along the Atlantic coast in 1937 was undoubtedly due to favorable weather, particularly the absence of drought. A partial second generation of the corn borer continued to occur in Michigan, Ohio, and Indiana, and was particularly noticeable in early sweet corn near Toledo, Ohio. (W. A. Baker, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

ARMYWORM

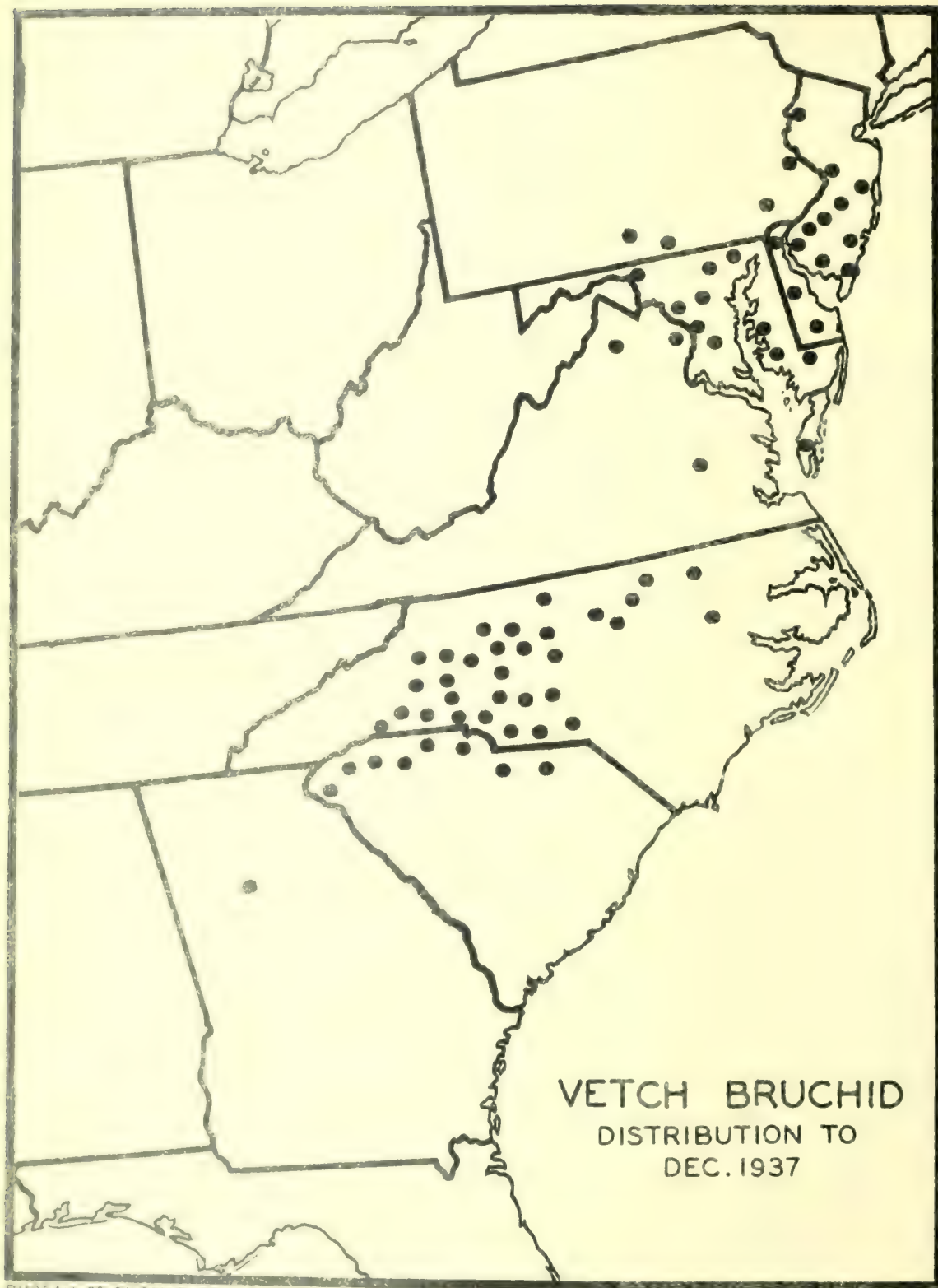
The armyworm was the outstanding insect pest in the Mississippi, Arkansas, and Ohio River Valleys in May and June. The outbreak

developed the first week in May in northwestern Mississippi, east-central Arkansas, and northeastern Louisiana. Some injury extended later into northern Texas and central and northeastern Oklahoma. The pest spread northeastward, causing severe injury to small grains, grasses, corn, and alfalfa in the southeastern half of Missouri, the southern three-fourths of Illinois, the southern half of Indiana and western and central Kentucky. The infestation extended from the above-mentioned area of severe injury into eastern Kansas, throughout Iowa into southern Minnesota, Wisconsin, and Michigan, and into Ohio and western New York. Small isolated outbreaks occurred in central Arizona, in Richland County in east-central Montana, and in southeastern North Dakota.

Along the Atlantic coast the insect occurred in destructive abundance in scattered localities in North Carolina, in the Norfolk district of Virginia, and on the Eastern Shore of Virginia and Maryland in June and damage was reported northward, reaching Maine the first week in August, when caterpillars were severely damaging oats and grasses in the central part of the State. This is the first time the insect has been reported in outbreak numbers in Maine for several years. A heavy flight of moths was reported from southern California and caterpillars were found attacking cotton in Kern County. A single specimen was taken in northern Florida, and moths were collected at lights in south-central Georgia. These States are rarely infested by armyworm.

CORN EAR WORM

The corn ear worm emerged from hibernation in great abundance and started its attack early. The mild winter probably permitted the insect to live over farther north than usual, as reports were received early in the season of severe injury to tomato and early sweet corn in the Southern States, northward to a line from northern Delaware to central Illinois. Early reports of serious damage to tomato in greenhouses in Ohio and Illinois were also received. This type of injury usually occurs late in the fall. As the season progressed, reports of serious injury to sweet corn were received from the entire eastern half of the country. An estimate of 50 percent infestation in extra early sweet corn in southern Connecticut was reported in July. Moths were observed in abundance in Maine, but no larval injury was reported. While early reports indicated that this year would be one of record-breaking abundance of this pest, for some reason increase in populations diminished materially by midseason. Field corn probably was not injured more than normally; however, the late crops of sweet corn were heavily infested. Considerable injury to late sweet corn occurred in southern Minnesota. Chrysanthemums were damaged in Wisconsin, as were peanuts in Oklahoma and gladiolus in Florida.



VETCH BRUCHID
DISTRIBUTION TO
DEC. 1937

WEBWORMS

The garden webworm occurred in outbreak numbers over the southeastern quarter of Nebraska, the eastern half of Kansas, over much of Oklahoma, and into northern and central Texas. The infestation also followed the Missouri River into central Missouri. The area of heaviest infestation centered in Oklahoma. Alfalfa was the principal crop attacked and corn, cotton, and garden crops were also damaged. An isolated point of infestation also occurred in northern Indiana and southwestern Michigan, where alfalfa was severely attacked, seedlings especially being destroyed.

The beet webworm was very abundant from southern and southeastern Idaho southward to southern Utah, and extended eastward into western Wyoming where the insect rarely becomes of economic importance. Isolated areas of infestation also occurred in northern Idaho, west-central Montana, and eastern North Dakota. Sugar beets, alfalfa, and truck crops were damaged.

VETCH BRUCHID

The vetch bruchid began emerging from hibernation quarters in North Carolina in April, the first adult being taken on the 17th. They were present in all vetch fields by the 1st of May, and the peak of overwintering adults in the field was reached on May 19. The abundance of adults was about the same as during the last 2 years. The weevil population, however, in this year's crop of seed is much lower than during the two previous seasons. The maximum infestation found was 65 percent, with a minimum of 9 percent, and an average of about 30 percent. The average infestation for the last 2 years has been 50 percent. Two factors seemed to have caused this condition, the rapid maturity of the crop and the fact that many of the pods set earliest, which received most of the egg deposition, failed to mature and produce seed. Most of the infested seed that came to the cleaning mills contained dead forms of various stages of the weevil and produced few living adults. One factor responsible for this was the rapid hardening of the seed this year, which caused the death of many first-, second-, and third-instar larvae through their inability to consume the hardened material. Many of the advanced stages were also found dead. This condition has not been noticed in previous observations.

During the course of the year the known distribution was increased by eight counties in three States as follows: Adams County, Pa.; Burke, Caldwell, Edgecombe, Halifax, Rutherford, and Polk Counties, N. C.; and York County, S. C. The attached map gives the known distribution in this country to date.

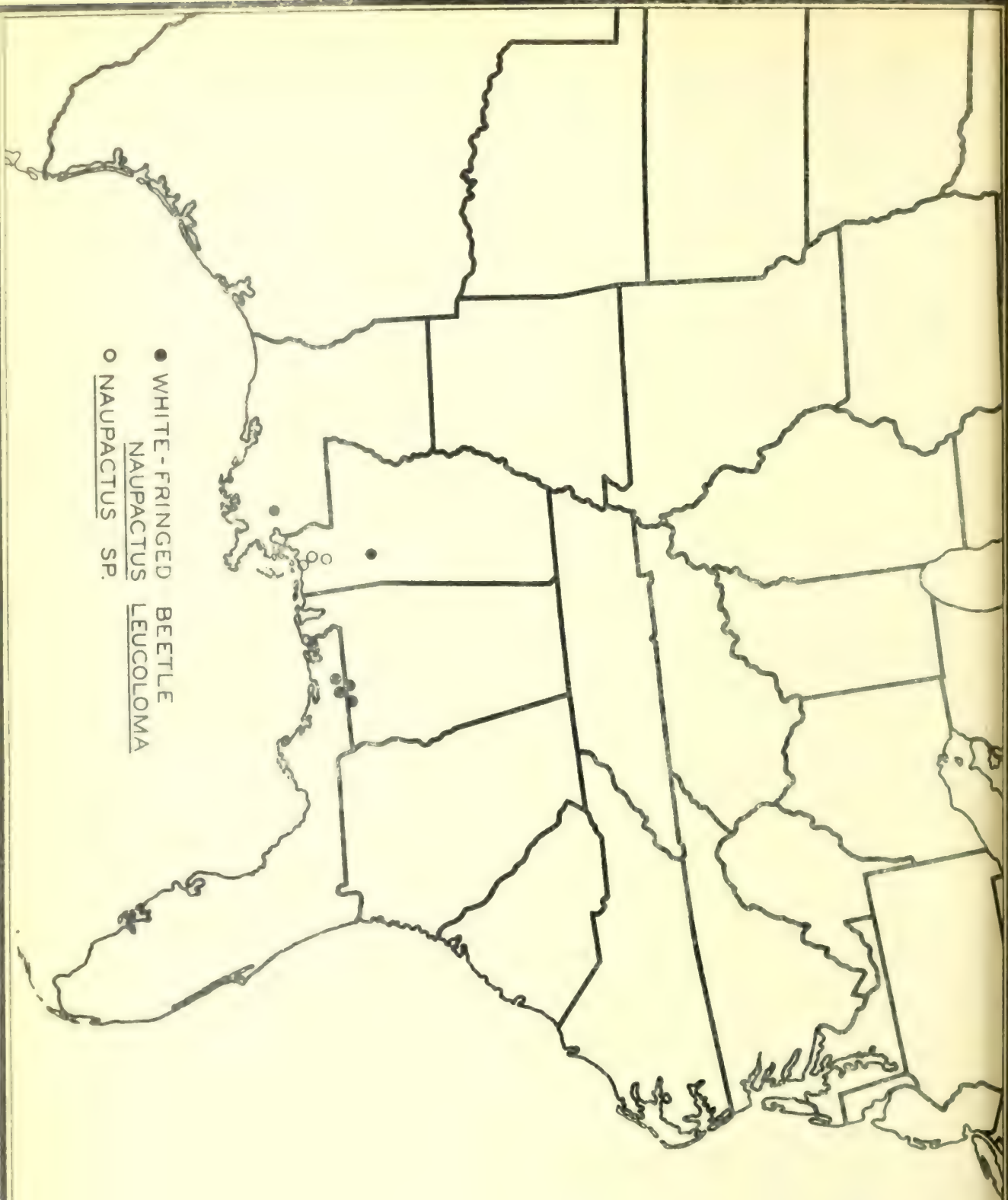
Collections of bruchid-infested seed were gathered in North

Carolina and in Pennsylvania during the summer and placed in rearing boxes for issuance of parasites. No new parasites were reared from the North Carolina material. From the material collected in Pennsylvania two parasites, Dibrachys cavus (Walk.) and Habrolepoidea tarsalis Gir., heretofore not known to attack this insect, were reared. Two new localities were listed for the European chalcid Bruchobius mayri Masi, which was reared for the first time in this country last year from material collected in Rowan County, N. C. Material collected in Iredell County, N. C., produced specimens of this parasite, and many specimens also issued from the material collected in the Adama County, Pa., bruchid infestation discovered last summer. In July one release of Trichogramma and several releases of Triaspis thoracicus Curt. were made at Arendtsville, Pa. One adult of T. thoracicus has been reared from the bruchid in collections made in the area of release. (I. S. Pinckney, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

ALFALFA WEEVIL

On the basis of the 1936 fall survey, severe and general damage by the weevil in 1937 was expected only in Mesa County, Colo., where three-fourths of the fields had threatening populations. One-fourth of the fields were menaced in the upper Snake River Valley of eastern Idaho, in Jackson County, Oreg., in Delta and Montrose Counties of western Colorado, in Douglas County, Nev., and in Sanpete County, Utah, while damage to 10-20 percent of the fields was indicated in Box Elder, Salt Lake, and Sevier Counties, Utah, and in Washoe County, Nev. Slight-to-negligible damage was expected in the lower Snake River Valley of western Idaho, eastern Oregon, Eagle Valley in Baker County, Oreg., and in Churchill County, Nev. General economic damage actually developed only in Douglas County, Nev., and Millard County, Utah, where the first crop was severely damaged in 50 percent of the fields. In Delta County, Colo., and in Eagle Valley of Baker County, Oreg., economic loss was light, although 25 and 35 percent of the fields, respectively, changed color, the injury being limited to tips of plants. Washoe County, Nev., Jackson County, Oreg., and Bonneville and Bingham Counties of eastern Idaho experienced light injury in 10 percent of the fields. In the following districts 5 percent of the fields developed light injury: Box Elder, Salt Lake, and Sanpete Counties, Utah, Jefferson, Madison, and Fremont Counties, Idaho, and Mesa and Montrose Counties, Colo. The damage was negligible in the remaining counties in Utah and Oregon, all of western Idaho, western Nebraska, eastern Wyoming, and the infested lowland district of central California. In Douglas County, Nev., the injury indicated by the fall survey was approximately 25 percent of the fields, but severe injury developed in 50 percent of them, the injury being mostly on large acreages where proper cutting could not be practiced. This injury was to some extent exaggerated by old, thin stands and poor growth. In Mesa County, Colo., on the contrary, where 75-percent

● WHITE-FRINGED BEETLE
NAUPACTUS
○ NAUPACTUS SP.
LEUCOLOMA



damage of the fields was expected only 5 percent were injured. This reduction was due primarily to heavy winter mortality and partly to unfavorable dry spring conditions. Millard County, Utah, was not surveyed but experienced severe damage to 50 percent of the fields. This is a seed district where the practices necessary to seed production always result in building up large adult populations by greatly delayed cutting of the second (seed) crop.

The 1937 fall survey shows that weevil populations have increased generally throughout the infested territory since 1936. The most important exception is Sioux County, Nebr., where the population has fallen to negligible proportions following return to more nearly normal weather conditions. Most severe damage for next year is indicated in Mesa and Delta Counties, Colo., Box Elder County, Utah, and Jackson County, Oreg., where from one-third to one-half of the fields have threatening adult populations. Approximately from one-fourth to one-third of the fields are menaced in Salt Lake and Sanpete Counties, Utah, the several counties constituting the upper Snake River Valley of eastern Idaho, Eagle Valley in Baker County, Oreg., and Douglas and Washoe Counties in western Nevada. One-tenth or less of the fields are threatened with damage in 1938 in Sevier County, Utah, the lower Snake River Valley in western Idaho and eastern Oregon, Churchill County, Nev., and Montrose County, Colo. This outlook is, of course, subject to modification by weather conditions during winter and spring.

Scouting during the summer of 1937 yielded new records of infestation in six counties located in three States, namely, Campbell, Johnson, Sheridan, and Weston Counties, Wyo., Custer County, S. D., and Modoc County, Calif., the last discovery having been made by representatives of the California State department of agriculture. (J. C. Hamlin, W. C. McDuffie, and R. W. Bunn, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

WHITE-FRINGED BEETLE

The white-fringed beetle (Naupactus leucoloma Boh.), a newly introduced pest which was first reported from this country in July 1936, appeared in great numbers in Walton and Okaloosa Counties, Fla., and in Covington County, Ala., in July 1937. Scouting in 1937 revealed that the infestation in southern Alabama and northwestern Florida covered approximately 27 square miles and involved parts of Covington and Geneva Counties, Ala., and Walton and Okaloosa Counties, Fla. Minor infestations were found at Pensacola, Fla., Laurel, Miss., and New Orleans, La. The density of the population at these last-mentioned places was considerably less than in the area centered around Florala, Ala. In the Florala area the larvae destroyed from 10 to 90 percent of the stand of field crops over areas ranging in

size from a few square yards to 10 acres. In many instances where the stands were materially reduced and second plantings were made these were also destroyed. The principal crops thus far damaged have been peanuts, corn, cotton, velvetbeans, sweetpotatoes, and cowpeas, although this insect has been found to attack more than 50 plants. In July the population of adults in many of the heavily infested fields in the Florala area was more than 150,000 per acre. The larval population in 41 fields during November and December averaged 184 larvae per square yard, or at the rate of approximately 890,000 per acre. In the heaviest infested fields larval populations of more than 1,000 per square yard have been found.

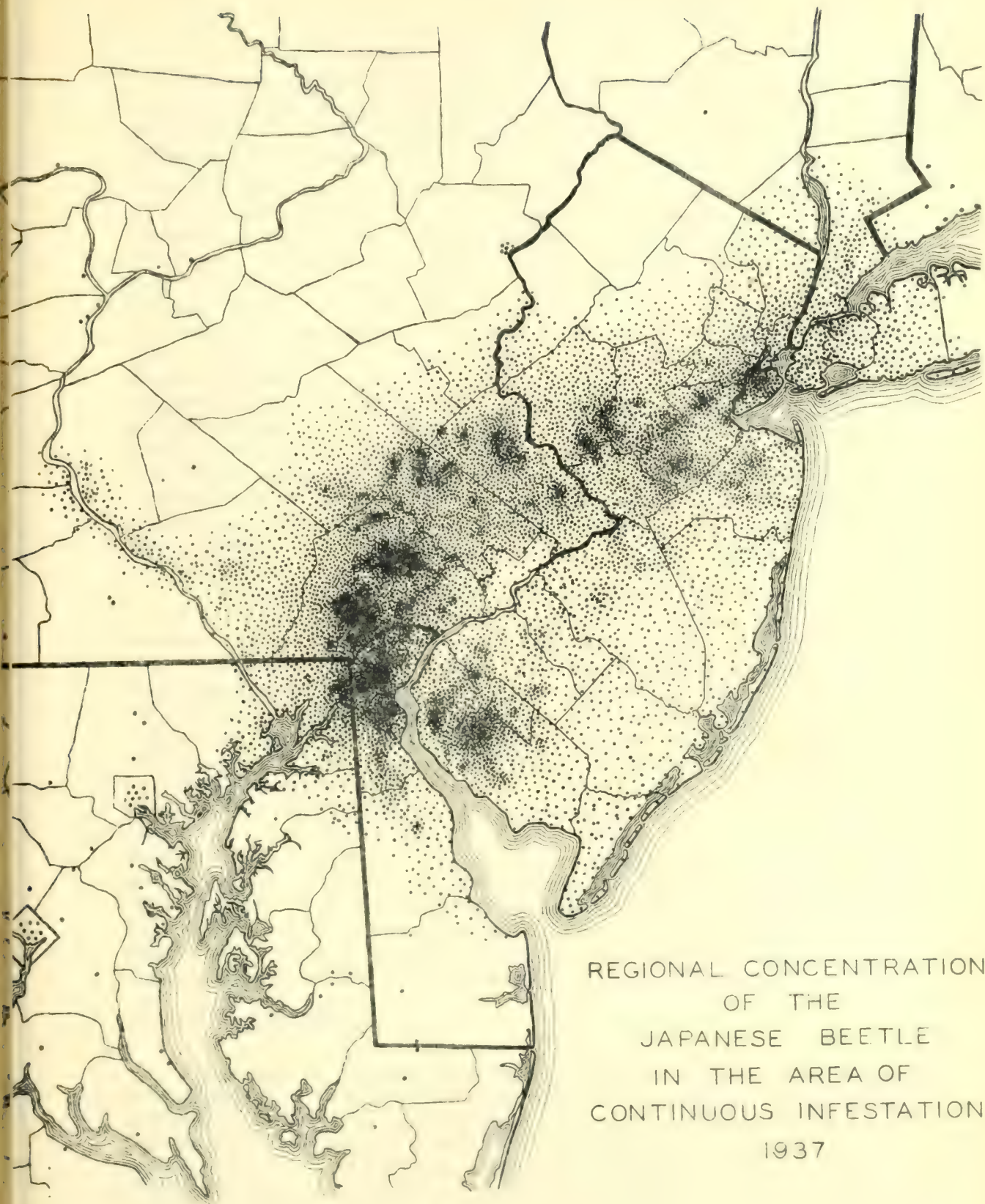
A new species of Naupactus was discovered in southern Mississippi in the vicinity of Gulfport. This species is known to occur in Harrison and Stone Counties, Miss., for a distance of approximately 25 miles northward from the Gulf coast. The habits of this insect are very similar to those of the white-fringed beetle. (H. C. Young, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

CLOVER LEAF WEEVIL

The clover leaf weevil appeared early in May and in the next 6 weeks did considerable injury to clover and alfalfa from western Ohio and southwestern Michigan, southwestward through Indiana, Kentucky, Illinois, southeastern Iowa, Missouri, and northwestern Arkansas into central Kansas and Oklahoma. Evidently disease or weather conditions prevented a second generation, as no reports of injury in the fall were received.

JAPANESE BEETLE

Throughout the area of continuous infestation of the Japanese beetle, as shown by the accompanying map, the winter of 1936-37 was extremely mild and the winter mortality of the beetle was no higher than normal. Spring weather and soil conditions in general were favorable for larval and pupal development and adult emergence was normal as to rate and relative date. Throughout large sections of the area of continuous infestation a general reduction in the 1937 beetle population was observed. Drought conditions of varying intensity that characterized the summer of 1936 throughout the greater part of New Jersey, eastern Pennsylvania, and northern Delaware, appear to have been the dominant factor in this reduction in population. The decrease in infestation was general throughout New Jersey, eastern Pennsylvania, particularly north of the Schuylkill River, and in the Philadelphia area; however, substantial increases were recorded in the New York City metropolitan area and on western Long Island, while in most of the newly infested territory lying on the periphery of the area of continuous infestation the usual increase in beetle



REGIONAL CONCENTRATION
OF THE
JAPANESE BEETLE
IN THE AREA OF
CONTINUOUS INFESTATION
1937



abundance was observed. Infestations were severe enough to develop tree injury of varying intensity within an extensive tract roughly arcuate in outline, which occupied southwestern New Jersey, northern Delaware, the southeastern tier of counties in Pennsylvania, north-central New Jersey, and the adjacent New York metropolitan area. At the close of the 1937 beetle season the area continuously infested was estimated at 13,851 square miles, distributed as follows: Delaware, 946; Maryland, 664; Pennsylvania, 4,358; New Jersey, 6,980; New York, 858; Connecticut, 45. Moisture conditions on the whole during the fall of 1937 were favorable for the new brood throughout much of Delaware, eastern Pennsylvania, and north-central New Jersey, so that a partial return to former conditions of abundance can be reasonably expected during the coming year in areas that experienced a marked decrease during the current season. This expectation is substantiated by the increase in soil populations encountered in grub surveys at a number of locations during the fall. However, in New Jersey south of Trenton, together with the area adjacent to the Delaware River in Pennsylvania, moisture conditions were not so favorable, with the probability that the 1938 infestation will remain somewhere near the current level.

In the New England area, the winter of 1936-37 was likewise quite mild, and larval survival seemed to be normal. It was noted, however, at an observation point in the northern range of the beetle that eggs known to have entered the hibernating period did not survive the winter. At most of the established points of infestation, the beetle population was definitely greater in 1937 than in 1936, although at some points in the more northern range, there was but little, if any, appreciable increase. In Connecticut, where beetles have been present for many years, infestations are especially numerous and heavy, and in the southeastern corner of the State the infestation has now merged with and become part of the main area of continuous infestation. There was no deficiency of rainfall last summer and fall, therefore, conditions for the soil population were very favorable. Larval surveys at several points showed that more larvae entered the winter hibernation period in 1937 than in 1936, indicating a further increase in the beetle population next year. (C. H. Hadley, Bureau of Entomology and Plant Quarantine, U.S.D.A.)

ASIATIC GARDEN BEETLE

No general surveys have been made during the year to determine the spread or abundance of the Asiatic garden beetle, but observations made in July in northern New Jersey indicate a still further reduction in the beetle population, in comparison with that of preceding years. At the colony center in Philadelphia, similar reduction in beetles was noted, although new local infestations were noted at several points. A reduction in beetle population and feeding on favored food plants was also noted at the colony center at Riverton, N. J. (C. H. Hadley, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

CODLING MOTH

Over the country in general codling moth development seemed late in starting, with retardation early in the summer because of cool, moist weather, and more rapid increase with warm dry weather later. Heavier infestations than usual are reported from Massachusetts, Delaware, and New Jersey, and in parts of Virginia and West Virginia, near Winchester, Va. The species decreased somewhat from 1936 in other parts of Virginia, Pennsylvania, and New York, also in Ontario, South Carolina, and Georgia. Over a wide midwestern area a high initial infestation did not increase much because of cool wet weather early in the summer, but built up rapidly late in the summer and the final population was extremely heavy. This was true in Indiana, southern Michigan, Illinois, Missouri, and Kansas. In Wisconsin and Iowa considerable build-up late in the summer was noted. Kentucky reported the species more abundant. Arkansas and Oklahoma reported light variable infestation after a crop failure and Idaho a light infestation because of winter mortality. Washington had less codling moth than last year, with a cool damp season, but noted some late increase. In southern Oregon and northern California heavier infestations were reported. (F. M. Wadley, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

EASTERN TENT CATERPILLAR

The eastern tent caterpillar was reported as decreasing in the Middle Atlantic Sections, where it has been abundant for several years, and as very abundant in parts of New England and the western parts of New York and Pennsylvania. The decrease was noted in Delaware, New Jersey, eastern New York, southern and central Pennsylvania, and Connecticut. Heavy infestations were noted in Vermont, Rhode Island, Maine, Massachusetts, western New York, and northwestern Pennsylvania, with local outbreaks in parts of Connecticut, South Carolina, and Georgia. New Hampshire reported destruction of larvae by storms at hatching time. The species was reported also from Mississippi, Arkansas, Florida, North Carolina, Kentucky, and Tennessee. The variation in seasonal history, owing to latitude, is shown in progress of hatching, from mid-March in the South to late April in Maine. (F. M. Wadley, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

PLUM CURCULIO

On the whole this species caused little damage and attracted little attention in 1937. Activity began on dates varying from April 10 in Georgia to mid-May in New York and New England. The species was recorded as light or less than normal in Minnesota, Wisconsin, Missouri, Ohio, Delaware, Virginia, and Georgia. It

was reported without comparisons from Michigan, Nebraska, and Iowa. Abundance was rated as about normal in Massachusetts and most parts of New York, but heavier than usual in Maine and in eastern New York. Considerable abundance or injury was reported from spots in Mississippi, northeastern Texas, and Connecticut. (F. M. Wadley, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

BEET LEAFHOPPER

The distribution of damage by the beet leafhopper during 1937 was very spotted. The spring migration occurred at about the normal time in all areas. Numbers were light to moderate in western Colorado, northern Utah, and California. Heavy migrations were received by the Sevier Valley in central Utah and by the Twin Falls area of southern Idaho. Only beets of varieties resistant to curly-top were planted in the last-named areas, but some damage was experienced, probably reducing yields from 1 to 3 tons per acre. In central California over 10,000 acres of resistant beets were planted in a new area, closely adjacent to the breeding grounds in the foothills. Weather conditions caused late planting, and most of the fields were severely damaged by curly-top. New plantings of beets in the Yakima Valley of Washington were damaged considerably by the leafhoppers from local breeding areas. No damage to beets in Montana or to spinach in Texas was reported this year. Tomatoes in central California were damaged more heavily this season than for the last three or four seasons. (W.C. Cook, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

PEA APHID

The pea aphid, although moderately abundant in 1937, in general did not occur in such numbers as were recorded during each of the last 3 or 4 years. Over much of its range the aphid appeared on peas rather late in the season, then increased in abundance very rapidly until some damage to peas resulted, only to decrease again in numbers before the end of the pea-harvesting season. This behavior was noted especially in New York, Indiana, Ohio, Illinois, Wisconsin, and Utah.

In the north-central section of the United States very few aphids were in evidence on either alfalfa or peas until after the middle of June. Before the first of July, however, infestation had increased to such an extent that control measures were necessary on most of the late pea acreage. In this north-central section aphids exhibited the unusual behavior of reaching a relatively low peak of population and then dispersing from peas in many instances before seriously injuring the crop and long before their food supply of green and succulent peas was exhausted.

Although predators, parasites, diseases, and, in some localities, adverse weather conditions are reported by various observers to have been responsible for the decrease in the abundance of the insect, it is believed that their diminishing numbers, in the north-central section at least, can be attributed to a pronounced reduction in the normal rate of reproduction rather than to the effect of natural enemies.

MEXICAN BEAN BEETLE

The year 1937 was about an average year for the Mexican bean beetle in the Eastern States, with the possible exception of the northern limit of its distribution. The high winter survival in many sections was probably offset by the smaller numbers entering hibernation in the fall of 1936. The beetle was more abundant in central and northern Ohio than usual, also in Massachusetts, Connecticut, New York, New Jersey, Delaware, and northern Indiana.

At Columbus, Ohio, the survival in the spring of 1937 was the highest of record. An average of 45.5 percent of the beetles placed in hibernation cages in the fall of 1936 survived and emerged in the spring of 1937. At Beltsville, Md., 63.6 percent survived; at Mappsville, Va., 25.65 percent; and at Clemson College, S. C., 50.26 percent. In the Ohio River Valley survival was high but beetles were not so numerous early in the spring as in some years, probably because fewer beetles entered hibernation in the fall.

In southern Ohio reproduction was rapid, causing large populations, but a summer drought slowed up reproduction and in the fall fewer beetles were present than usual. In central Ohio populations were larger than usual. In many sections of the East and South reproduction was rapid and populations were large. At Grand Junction, Colo., the survival over winter was very low, less than 1 percent.

New records of distribution include Niagara County, N. Y.: Yalobusha County, Miss.; and Dale County, Ala. (N. E. Howard, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

TOMATO PINWORM

The cold spell of January 1937 materially reduced tomato pinworm survival and cold nights during the spring and early summer acted as a further check on pinworm build-up, as compared to that of 1936. Although various degrees of infestation could be found in all areas of southern California by July 1, actual commercial damage did not occur until the latter part of September. By that time the insect had built up in early tomato fields, or on tomato plants taken from infested seed beds, until from 25 to 50 percent of the fruit was

infested. Consequently, many late fields which were near early infested fields or which were started from infested seed beds became heavily infested (50 to 90% wormy fruit) by November 1. The Vista area of San Diego County, a small area near Riverside in Riverside County, several semifrostless areas of Orange County, and an upland area near San Fernando in Los Angeles County experienced this type of heavy damage in late tomato fields. In general, the lowland areas or the areas of a comparatively short tomato-growing season experienced little or no damage from pinworm attack. In the El Cajon Valley of San Diego County, where the tomato pinworm has caused serious losses to the large late tomato crop in the past, infestations were at a low point this year because small early plantings, on which the pinworm has usually built up, were entirely omitted. In the Simi and Santa Rosa Valleys of Ventura County, infestations in tomatoes ranged from a trace to 17 percent, with little commercial damage. The pinworm was not found in Santa Barbara and San Luis Obispo Counties. A survey made on November 15 to 20, revealed the presence of the tomato pinworm in the counties of Kern, Tulare, Fresno, Madera, Merced, Stanislaus, and Sant Clara. It had previously been reported from Santa Clara, Kern, Tulare, and Stanislaus Counties. In Merced, Madera, and Fresno Counties, from 80 to 90 percent of the fruit left on the vines in several fields was infested. (J. C. Elmore, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

Note.--The first report of the occurrence of the tomato pinworm in Arizona was made in June, when tomato fields northeast of Phoenix were found to be generally infested. The insect injured tomatoes in Manatee and Sarasota Counties, Fla., and a survey over the southern half of the peninsula disclosed general light infestations. Although a report on March 22, 1937, stated that the insect was living through the winter out of doors in the Philadelphia district, no reports of infestation were received during the summer and a report late in the season indicated that cooperative control had reduced the pest and that eradication is expected. The insect is believed to have been eradicated in Delaware.

CABBAGE WORMS

In the Charleston area some injury to the spring crop was noticeable at the end of the season. Although all species were present and increased in numbers rapidly as the season advanced, the cabbage looper was responsible for the greater part of the injury. The diamondback moth was next in importance but was not sufficiently abundant to cause economic injury. The imported cabbage worm was of no economic importance until the end of the season, when it was responsible for some injury. Summer surveys on available cruciferous plants indicated that cabbage loopers, diamondback moths, imported cabbage moths, several species of

Agrotinae, and webworms were present throughout the summer. Of these, the looper was the most abundant but the numbers of both loopers and imported cabbage worms decreased gradually toward the end of the summer. Diamondback moths were present in relatively small numbers and the Agrotinae and webworms were not conspicuous until early in the fall. The predominating species present on the fall crop were those of the Agrotinae, except during the latter part of the period when loopers predominated. Slight injury resulted from the presence of these species but cold weather in November definitely checked any further development. The diamondback moth and the imported cabbage worm were present but of no particular economic importance.

In Louisiana during the spring the populations of cabbage worms were below normal and infestations occurred only in isolated spots. There appeared to be an especially heavy parasitization of the imported cabbage worm. During the summer, loopers, diamondback moths, and cross-striped cabbage worms were present on cruciferous plants. Loopers predominated until September, when the imported cabbage worm increased to major proportions. The fall crop suffered but little from cabbage worms. Early in the season the imported cabbage worm was the predominating species but later the looper became most numerous. What appeared to be a rapid increase of diamondback moths was checked by cold weather late in November. (C. F. Stahl, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

VEGETABLE WEEVIL

During the winter and spring of 1936-37, the vegetable weevil was reported as doing more than the usual amount of damage in the Gulf coast territory and also in southern California. It was reported in destructive abundance for the first time in Florida. In This State it was also reported as damaging tobacco. This is the first record of its attacking this host plant in the U. S.

A WHITEFLY

A whitefly, Trialeurodes abutilonea Hald., was reported by H. G. Walker as occurring in injurious numbers on beans in Norfolk and Princess Anne Counties, Va., during the fall of 1937. This is the first report of this insect attacking beans.

TOBACCO FLEA BEETLE

The records obtained in 1937 showed that tobacco flea beetles were abundant in all of the principal tobacco-producing areas. This pest was destructive to newly set plants in South Carolina, North Carolina, Virginia, Maryland, Tennessee, and Kentucky. In North Carolina, South Carolina, and Virginia considerable damage was inflicted in plant beds and in many localities it was necessary to

replant fields of tobacco several times as a result of flea beetle attack on the newly set plants. The most severe outbreak reported occurred in western North Carolina, in Guilford, Forsyth, Stokes, Surry, Yadkin, Person, and Granville Counties.

The overwintered adults began activity in South Carolina tobacco districts on warm days in February and in North Carolina some activity was noted early in March. In studies made at Oxford, N. C., it was found that 24.1 percent of the overwintering flea beetles survived in cages located at the edge of a woods, while there was a survival of 33.6 percent in similar cages located from 6 to 8 feet within the woods. Samples taken nearby in the same woods indicated a survival under natural conditions of 17.1 percent. The first activity of this insect in Tennessee was reported on April 12.

Infestations in the cigar tobacco-producing districts of Florida and southern Georgia were much heavier in 1937 than in 1936. In Connecticut this insect was recorded as occurring sporadically and in small numbers on cigar tobacco. (W. D. Reed, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

POTATO FLEA BEETLE

This insect was unusually abundant in the cigar tobacco districts of the Connecticut River Valley and inflicted severe damage on newly set tobacco plants during June. Owing to control measures, the succeeding broods did not develop large populations in tobacco shades but normal populations developed in untreated fields of sun-grown cigar tobaccos. (W. D. Reed, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

HORNWORMS

Hornworms were more abundant in 1937 than in 1936 in all tobacco districts from which records were obtained and in many sections severe outbreaks occurred on tobacco. In the Florida and Georgia tobacco-producing areas the predominant species, Protoparce sexta Johan., began emergence about May 1. The first eggs and young larvae were collected from the field on May 8. Observations made in 1937 indicated that three generations of P. sexta developed in tobacco fields of this district during the year.

Both P. quinquemaculata Haw. and P. sexta appeared at about the same time in 1937 as in 1936 in the Bright-tobacco Belt, but the infestations were more severe in 1937. The first eggs were collected from tobacco fields in the vicinity of Oxford, N. C., on May 24 and at Florence, S. C., on May 13. The first adults captured with

traps located in the field in North Carolina were taken on May 27. The first moths emerged from hibernation cages located at Oxford on June 7. The damage from hornworms in North Carolina was widespread, especially in late tobacco. Both species appeared late in the season in destructive numbers on cigar tobaccos in the Connecticut River Valley. Earlier in the season P. sexta was more abundant, but later the numbers of P. quinquemaculata predominated. Considerable damage was recorded in fields and barns of late harvested tobacco.

Heavy parasitization on the late broods of larvae by Apanteles congregatus (Say) was recorded in North Carolina and Connecticut. (W. D. Reed, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

TOBACCO BUDWORM

Infestation of the tobacco budworm was general throughout the principal producing districts in 1937. The degree of infestation was about the same as for 1936 in the Florida and Georgia districts and in the Bright-tobacco Belt. In the Tennessee and Kentucky districts no unusual outbreaks were reported on Burley and dark fire-cured tobaccos. The only specimens observed in the Connecticut district were taken from potted tobacco plants located on the grounds of the Tobacco Experiment Station at Windsor. (W.D. Reed, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

TOBACCO THRIPS

This pest caused severe damage to shade-grown tobacco in the Florida district in 1936 but in 1937, owing apparently to abundant rainfall, little damage was reported. Damage to shade tobacco was reported from several districts in the Connecticut River Valley, the injury being more severe around edges of fields bordering on grass-land. The commercial damage was observed to be less than in 1936 in tobacco shades, owing perhaps to the widespread use of dusts for controlling the potato flea beetle. (W. D. Reed, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

CIGARETTE BEETLE

Reports obtained from light traps operating in Virginia, North Carolina, New Jersey, New York, and Connecticut showed that the cigarette beetle was somewhat more abundant in tobacco factories and warehouses of stored tobacco in 1937 than in 1936. The spring brood of beetles began emergence in Virginia around May 8 and activity was noted in warehouses until about November 1. (W. D. Reed, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

TOBACCO MOTH

The populations of the tobacco moth were greater in 1937 than in 1936, especially in open warehouses of stored domestic cigarette tobaccos where no control measures were applied. Destructive infestations were recorded also in warehouses of imported cigarette tobaccos. The spring brood of moths began emergence around April 25 in the tobacco warehouses of Virginia and North Carolina and the heaviest damage was observed in open storage. (W. D. Reed, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

BOLL WEEVIL

For the second consecutive year, the boll weevil damage over the greater part of the Cotton Belt was very light in 1937. The rather small number of weevils entering hibernation in the fall of 1936 were favored by mild winter temperatures which caused very low mortality. The survival in hibernation cages at Florence, S. C., equaled the previous high in 1933, while at Tallulah, La., and at College Station, Tex., it was the highest since 1932. Emergence continued over a longer period and later into the season than usual at Florence and Tallulah but was more nearly normal at College Station. As a result of the high survival, weevils were fairly abundant in the fields in the early part of 1937, notwithstanding the small numbers that entered hibernation the previous fall. However, the prospects for a year of normal or heavy weevil damage was changed by the hot and dry weather, which effectively checked weevil multiplication and damage, except in the States along the Atlantic seaboard and in eastern Texas. In these sections the damage was greater than it has been for several years, but in large areas in the central part of the belt damage was lighter and less insecticide was needed for control than in many years. Conditions were very favorable for cotton growth and the average yield per acre and total production for the United States were the highest ever recorded. During the latter part of the summer and fall abundant rains produced a large crop of late squares and bolls in which weevils multiplied rapidly and became very numerous before frost. The cotton leaf worm caused very little defoliation and conditions were favorable for higher than average numbers of well-fed weevils to enter hibernation. (U. C. Loftin, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

COTTON LEAF WORM

The first appearance of the cotton leaf worm in 1937 was reported by the experiment station entomologist from southern Texas on May 27--2 weeks later than last year. Spread was very slow and records of appearances in other areas were as follows: Port Lavaca, Tex., June 9; Gainesville, Fla., July 6; College Station, Tex., July 23; Presidio, Tex., July 24; Tallulah, La., August 7; Florence,

S. C. August 25; and Stoneville, Miss., September 4. Judging from the dates of observation, the moths apparently entered the United States in three areas--southern Texas, Florida, and the irrigated districts from western Texas to Arizona. Defoliation of cotton was very light and control was needed only on late plantings. (U. C. Loftin, Bureau of Entomology and Plant Quarantine, U. S. D.A.)

BOLLWORM

Emergence of bollworm moths in hibernation cages at College Station, Tex., was about 20 percent greater than in 1936. Eggs were not as abundant on corn early in the season as usual and oviposition on cotton in July was much lighter and the infestation was more spotted in Brazos and Burleson Counties, Tex., than in 1936. Very severe damage was caused to late-planted cotton in Calhoun, Jackson, and other southern Texas counties. More than average damage was also reported from southern Georgia and Florida, but on the whole there was less damage to cotton than normally. (U. C. Loftin, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

BEET ARMYWORM

Outbreaks of the beet armyworm in the Salt River Valley of Arizona for the third consecutive year indicate that this species is becoming one of the major local pests of cotton. In 1937 the damage extended over a large area but was most severe in the Buckeye Valle, where several hundred acres of cotton had to be replanted. Injury consists of feeding on the leaves and terminal buds of the cotton seedlings and girdling of the stems near the surface of the ground, which causes either the death of the plants or the formation of plants with several stems and excessive branching. (T. F. Cassidy, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

COTTON FLEA HOPPER

The emergence of flea hoppers from overwintering eggs, as indicated in hibernation cages at Port Lavaca, Tex., was about normal in numbers though the peak of emergence was earlier than usual. During May and June, or the period of heaviest dispersal to cotton, the hopper population on cotton was greater than in 1936 but less than during the three preceding years. On the whole, damage was less than normal in southern Texas in 1937, although local areas experienced considerable injury. The comparatively light damage was influenced by the dry weather during April and May that caused a shortage of succulent weed host plants and insufficient moisture for maximum hatching of eggs. The population on cotton increased rapidly during the latter part of June, but by that time the early planted cotton had set a crop of large squares and bolls that were beyond the stage of flea hopper injury. Reports received from other sections indicated considerable damage in local areas of northern Georgia, but only light damage elsewhere. (U. C. Loftin, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

PERIODICAL CICADA

Brood XXIII, the most widespread of the 13-year race of the periodical cicada, appeared over most of the territory where it was expected.

Brood XI, belonging to the 17-year race, a small, isolated brood, which, it was feared, had become extinct as no record was made of its appearance in 1920, was reported in 1937 from one area of not more than 10 acres near East Willington, Tolland County, in north-central Connecticut.

Records of the occurrence of the insect in Perry County, Pa., and from Delaware, Erie, and Greene Counties, Ohio, cannot be definitely associated with either of the broods appearing this year.

The rest of the records of the year are being placed in Brood XXIII as follows, the counties being underscored:

Alabama:

Etowah, Gadsden; Lauderdale, Waterloo; Madison, between New Hope and Paint Creek.

Arkansas:

Arkansas; Clay; Craighead; Cross; Franklin; Jackson; Jefferson; Lawrence; Lee; Lincoln; Lonoke; Mississippi; Monroe; Prairie; Poinsett; Pulaski; Scott; Saint Francis; Washington; Woodruff.

Illinois:

Alexander; Pulaski; Union.

Indiana:

Knox, Vincennes; Sullivan, Shelburn.

Kansas:

Allen; Chautauqua, Peru; Douglas; Franklin; Montgomery, Caney, Coffeyville; Neosho; Shawnee.

Kentucky:

Ballard, Wickliffe, also most of the rest of the county; Bath, Owingsville; Bracken, Lenoxburg, Milford, Wellsburg; Butler, Quality; Calloway, over most of county in large numbers; Carlisle, along Mississippi River, later appeared over most of county; Edmonson, Chalybeate Springs; Elliott, a few observed on hilltops; Fulton, Hickman, Fulton; Grant, Williamstown; Graves, Cuba, Farmington, Mayfield, Pryorsburg; Grayson, Grayson Springs, Meredith, Falls of Rough; Hart, Munfordville;

Hickman, over entire county; Lyon, Popular Creek, Confederate;
Pendleton, Falmouth; Pike, Shelby Creek; Rowan, in small
numbers in every section of county; Warren, Rockland.

Louisiana:

Caldwell, Columbia, Crayson.

Mississippi:

Alcorn, Corinth; Chickasaw; George; Grenada, Grenada; Jackson;
Montgomery, Kilmichael; Newton, Decatur; Pike, Magnolia;
Pontotoc; Tippah; Tishomingo, Iuka; Wayne; Greene.

Missouri:

Douglas; Howell; Mississippi; Scott; Stoddard.

Ohio:

Butler, along Indian Creek; Hamilton, Mount Airy.

Tennessee:

Lauderdale; Shelby, Memphis; Tipton.

GYPSY MOTH

The hatch of gypsy moth egg clusters in the spring of 1937 was practically complete over the entire infested territory, owing to the fact that the winter of 1936-37 was very mild; hence, the exposed egg clusters were not subjected to extreme low temperatures. During the summer a total of 680,760 acres of woodland were partially or totally defoliated, this being over 50,000 acres more than any previous record of defoliation. In Maine, the areas of defoliation were much more extensive than in 1936 and likewise, much more extensive than have ever been recorded for that State. This increase was almost uniform throughout the infested territory, as much more extensive areas of defoliation were noted than ever before in all counties, with the exception of York, the most southern one. In New Hampshire areas of defoliation were less extensive than in 1936. In that State the total acreage recorded has been decreasing during the last 2 years. In Massachusetts more defoliation was recorded than ever before and there was a very marked increase from the records of 1936, the 1937 total being more than double that recorded for the previous year and nearly double the highest ever recorded. For most of the territory east of the Connecticut River, with the exception of the Cape Cod district, the increases in acreages of defoliation over 1936 were very marked and for most counties the totals were higher than ever recorded. While there was a slight increase in certain sections of Cape Cod, the defoliation in that section was nowhere near so extensive as has been recorded previously. For the territory immediately east of the Connecticut River the increase in size of areas

defoliated was particularly marked. In Rhode Island there was a slight decrease in extent of areas showing defoliation, while in Vermont and Connecticut defoliation was very light. (A. F. Burgess, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

BROWN-TAIL MOTH

During the summer of 1937 there were no reports of extensive defoliation by the brown-tail moth. As a whole, the infestation over the entire area was light. The wholesale cutting of webs during the fall and winter of 1935-36 and 1936-37 helped greatly in reducing the infestation. During the fall and winter of 1936-37 a total of 743,610 winter webs were cut in Maine; 1,523,478 in New Hampshire; 3 in Vermont; 779,404 in Massachusetts; and 44 in Rhode Island, making a total of 3,046,539. (A. F. Burgess, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

SATIN MOTH

The satin moth seemed to be somewhat more noticeable in various sections of New England than in 1936, although no extensive areas of defoliation were noted in any locality. In Maine towns in the south and southwestern part were generally infested and some noticeable defoliation was noted in different sections of the infested area. In southeastern and central New Hampshire some of the towns were generally infested, but no heavy defoliation was noted. In Vermont some heavy defoliation was noted in the eastern part of the State along the Connecticut River. In Massachusetts heavy defoliation was noted in some sections of the State, several large Carolina poplars in Pittsfield and Provincetown being entirely defoliated. In Rhode Island the whole State was lightly infested, although several poplar trees in Barrington were noticeably defoliated. In Connecticut all towns east of the Connecticut River were lightly infested, although heavy defoliation was noted in New London. (A. F. Burgess, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

Defoliation by the satin moth in western Washington was negligible in 1937, probably as a result of the effective work of introduced parasites. However, at the southern extension of its range in the Willamette Valley of Oregon, heavy defoliation of white poplars was noted. (F. P. Keen, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

NATIVE ELM BARK BEETLE

The native elm bark beetle (Hylurgopinus rufipes Eich.) is not considered to be of as much importance in the spread of the Dutch elm disease fungus as is the smaller European elm bark

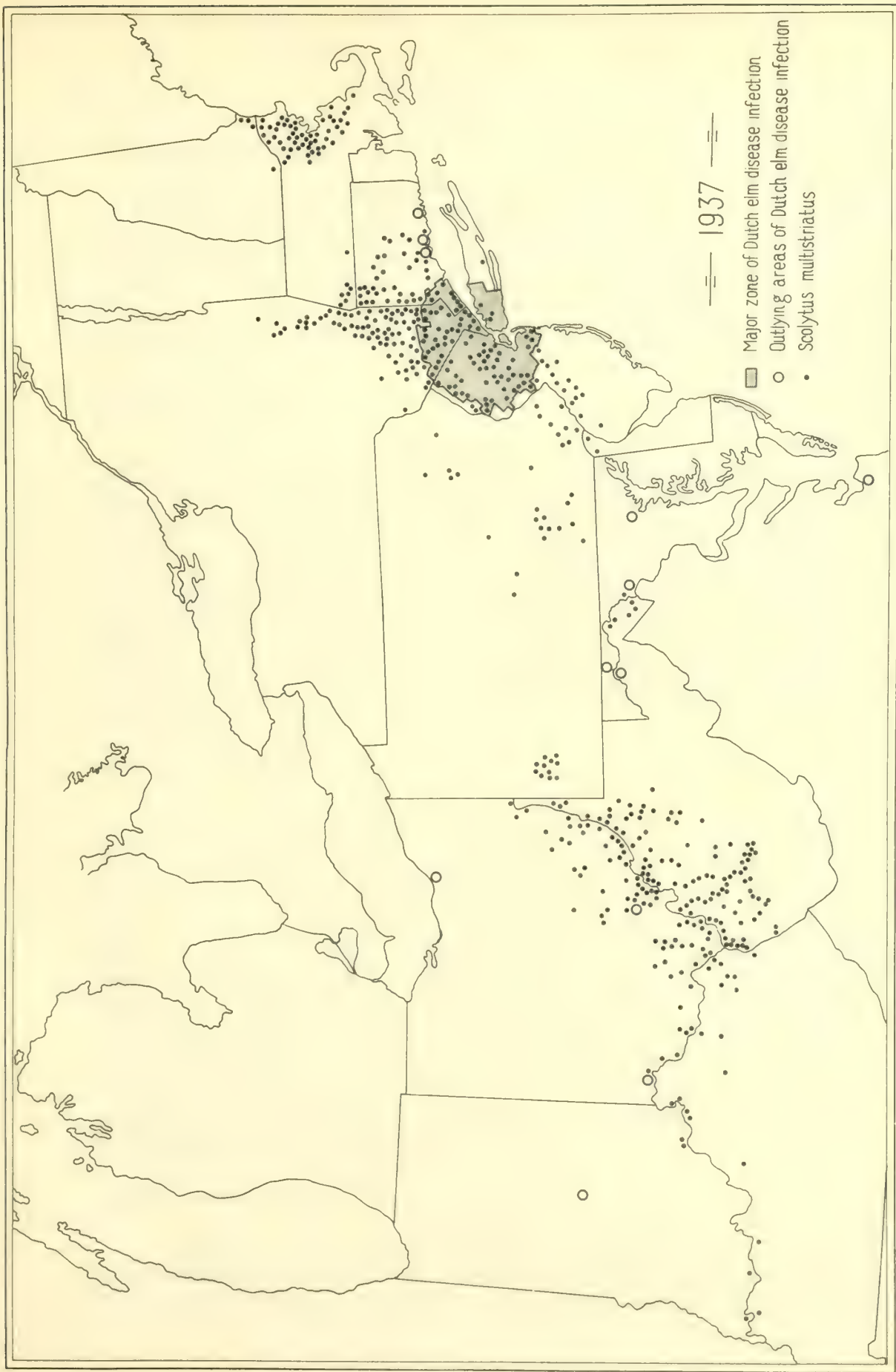
beetle (Scolytus multistriatus Marsh.). However, in obtaining distribution records of the latter species, attention has also been given to H. rufipes. We have many records of its occurrence in the eastern half of the United States. The area of known distribution is roughly bounded by the following places where the species has been taken: Augusta, Maine; Norfolk, Va.; Decatur, Ala.; Yazoo City, Miss.; Lawrence, Kans.; and Brandon, Minn. (C. W. Collins, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

SMALLER EUROPEAN ELM BARK BEETLE

The smaller European elm bark beetle (Scolytus multistriatus Marsh.) is considered the most important insect vector of the Dutch elm disease fungus in the United States. Until 1936 the insect was known to occur in two distinct areas. One covered parts of eastern Massachusetts and southeastern New Hampshire. The other included parts of western Connecticut, southeastern New York, eastern Pennsylvania, northern Delaware, and northern New Jersey. In 1936 scouts connected with the Bureau's Dutch elm disease eradication unit found the insect at Parkersburg, W. Va. Since then that unit and the Morristown, N. J., laboratory have cooperated in getting additional information concerning the distribution of the species. It has been found to be well established in a large contiguous territory including parts of West Virginia, Ohio, Indiana, and Kentucky bordering on the Ohio River from East Liverpool, Ohio, to Evansville, Ind. The known infested area lies mostly in Ohio and West Virginia. At some points in Ohio it extends back from the river for approximately 50 miles and at some points in West Virginia for approximately 60 miles. Two other infested areas have been found. One is about 225 square miles in extent and lies just south of Pittsburg, Pa. The other area includes six localities where the beetle has been found in the vicinity of Martinsburg, W. Va. Five of these localities are in West Virginia and one is in Maryland. The attached map shows the known distribution of S. multistriatus and the Dutch elm disease. (C. W. Collins, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

EASTERN SPRUCE BEETLE

The eastern spruce beetle has continued its ravages in 1937 causing heavy mortality in overmature spruce on large areas in the Green Mountains of Vermont and the Adirondacks in New York, where outbreaks apparently have been in progress for the last several years. Salvage operations are being carried on in some of the infested areas in the Green Mountains. (R. C. Brown, Bureau of Entomology and Plant Quarantine, U. S. D. A.)





SOUTHERN PINE BEETLE

Rather severe outbreaks of the southern pine beetle occurred in several localities in southeastern Virginia in 1937. Considerable loblolly pine of merchantable size was killed in the vicinity of West Point, Va. Local outbreaks were also reported along the Eastern Shore of Maryland. Brought in 1936, which lowered the vitality of the trees, was probably the important factor aiding the increase of this species. (R. A. St. George, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

BLACK HILLS BEETLE

In the Central Rocky Mountain region the serious outbreak of the Black Hills beetle increased considerably over 1936 in areas where no control was carried on. It is estimated that in south-central Wyoming some 210,000 limber pine and lodgepole pine are infested. In Colorado, in an area extending along the eastern range of the Rockies from the northern to the central part of the State, fall surveys indicated that 44,000 ponderosa pine were infested during the current flight of this beetle. The epidemic in southern Utah has been greatly reduced by control operations during the last two seasons; however, about 4,000 infested ponderosa pine were found in known epidemic areas. (J. A. Beal, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

MOUNTAIN PINE BEETLE

In the Pacific Coast States the mountain pine beetle was in an endemic stage during 1937. In northern Idaho, in stands of western white pine, only four small epidemic areas were found, necessitating the treating of 4,000 infested trees. In stands of white bark pine, which occurs at high elevations, the beetle continued to cause severe damage throughout the northern Rocky Mountain region. However, the great epidemic which in recent years spread through the lodgepole stands of Idaho and southwestern Montana has materially decreased. Toward the eastern edge of its range, southeast of Yellowstone Park and in north-central Wyoming, the beetle continued to be very destructive and killed several hundred thousand trees over a large area. Here again a very high percentage of the trees infested were either white-bark pine or a closely related species, limber pine. (Division of Forest Insect Investigations, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

WESTERN PINE BEETLE

Extensive surveys in Oregon and Washington, covering 8,600,000 acres during the summer, indicated that attacks by the western pine beetle had declined during 1937. Most areas carried endemic infesta-

tions of from 25 to 50 infested ponderosa pine per section, but a few areas showed losses as high as 100 trees per section. In California similar surveys indicated that the decline of infestation trends which appeared in 1935 and 1936 is now leveling out and by late fall a tendency toward an increase was noted in some areas. A severe cold spell in January 1937 killed about the same proportion of western pine beetle broods in northeastern California as the freeze of December 1932; however, the recovery of populations has not been so rapid this year. In the Northern Rocky Mountain region the beetle remained in an endemic status. (Division of Forest Insect Investigations, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

DOUGLAS FIR BEETLE

Epidemics of Dendroctonus pseudotsugae Hopk. continued in the scattered stands of Douglas fir in many areas throughout the entire Rocky Mountain region. In some of the worst infested areas 50 percent or more of the stand has been destroyed. In Oregon this beetle continued in an endemic status in the vicinity of the great Tillamook Burn, where in 1935 it increased to alarming proportions. (Division of Forest Insect Investigations, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

ENGELMANN SPRUCE BEETLE

A severe outbreak of the Engelmann spruce beetle is present in the northwestern part of Yellowstone National Park. During the past few years a large percentage of the spruce trees above 10 inches in diameter have been killed. In western Montana, on the Kootenai and Gallatin National Forests, spruce stands have also been found to be infested with this beetle. (J. C. Evenden, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

BALSAM BARK BEETLE

Dryocoetes confusus Sw. continued to kill large quantities of alpine fir in the central Rocky Mountain region, as it has been doing for the last few years. (J. A. Beal, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

MOUNTAIN ASH SAWFLY

This European sawfly, Pristiphora geniculata Htg., which attacks mountain ash, was quite generally abundant in 1937 wherever its food plant is common in New England and New York. The defoliation was noted as particularly heavy on the trees growing on the higher elevations in Maine, New Hampshire, and Vermont. (R. C. Brown, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

A PINE SAWFLY

Serious local outbreaks of a sawfly, Neodiprion sp., in a few red pine plantations in Middlesex County, Mass., attracted attention in 1935 and 1936. In 1937 severe infestations occurred in one natural stand and several plantations of red pine in Middlesex and Worcester Counties, Mass. Heavy defoliation was prevented in most of the plantations by timely spraying. Most of the eggs are deposited in the needles of the red pine in October, and it has been recently observed that in some localities where no insecticides had been applied in 1937 the egg deposit is heavy. This indicates that it is a potential menace to red pine in these localities for 1938. (R. C. Brown, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

A SAWFLY

A sawfly, Neodiprion sertifer Geoff., apparently was introduced into New Jersey from Europe prior to 1925 but has only recently been identified. Because this species is a serious pest of pine in Europe an extensive survey was made in the spring of 1937 through the area surrounding the locality where it was first collected in 1925. Infestations were found in 22 localities scattered through Hunterdon, Mercer, Middlesex, Somerset, and Union Counties, N. J. The scarcity of pine plantations and the infrequent use of hard pines as ornamentals in these counties undoubtedly have been factors in limiting the dispersion of this pest. Pinus montana (Swiss mountain pine), and the variety mughus, P. sylvestris (Scotch pine), and P. densiflora (Japanese red pine) seemed to be most heavily attacked, but P. resinosa (red pine) and P. austriaca (Austrian pine) were also commonly attacked, though apparently to a lesser degree.

A note in the Bureau of Entomology and Plant Quarantine News Letter for September 1937 (Vol. 4, No. 11, p. 31, Nov. 1, 1937) records the identifications of adults of this species taken on Pinus mughus at Sidney, Ohio. (R. C. Brown, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

EUROPEAN SPRUCE SAWFLY

A tremendous increase in the abundance of the European Spruce Sawfly occurred in New England in 1937. Heavy infestations occurred in several localities in northern Maine, on Mount Monadnock, N. H., and at Wilmington and Lincoln, Vt. In 1937 the spruce on approximately 30,000 acres showed noticeable defoliation and some tree mortality has occurred in northern Maine. A large population of cocoons is now present in the heavily infested areas and a heavy attack over a much larger acreage is probable in 1938. Larvae and

cocoons were found in two localities in Somerset County, N. J., in June, but defoliation was scarcely noticeable. (R. C. Brown, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

LARCH SAWFLY

The larch sawfly, a common eastern species, was recorded in outbreak form on the north fork of the Flathead River in western Montana about 3 years ago. This epidemic does not appear to be increasing in severity, though the insect is still present and is doing some damage in small areas. Oviposition scars indicate that it has been present in some areas for several years without causing serious damage, and it is possible that conditions in Montana are not favorable for its development. In northern Minnesota the sawfly is at its lowest stage in many years, having practically disappeared in many localities. This reduction apparently was largely due to the extreme heat and drought of 1936, causing an exceptionally heavy mortality to the larvae before they matured. (Division of Forest Insect Investigations, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

FOREST TENT CATERPILLAR

In the Northeast severe outbreaks of the forest tent caterpillar were very noticeable in many localities. Heavy defoliation was observed on thousands of acres of forests in Maine, Vermont, and New York, and in more limited areas in New Hampshire, western Massachusetts, and northwestern Connecticut. In parts of Vermont many sugar maple orchards were severely attacked, as well as large areas of forests, although the degree of defoliation in general was not as high as in 1936. A survey of plots in Vermont indicated that the 1937 egg deposit averaged about 20 percent lower than in 1936. However, in some sugar maple orchards there is an increase in egg clusters, and in general the insect can be considered a potential menace for 1938. In northern Minnesota the outbreak covered some 5,000,000 acres of forest land. In general there was a decline in the severity of the 1937 infestation as compared to the severe epidemic in 1936. Greatest reductions occurred in the oldest centers of heavy infestation. In recently infested areas there will probably be a considerable increase in caterpillar populations in 1938. (Division of Forest Insect Investigations, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

SPRUCE BUDWORM

In central Colorado the spruce budworm was found to be causing excessive damage to ponderosa pine in several areas. This is probably the first record of serious injury in pure stands of

ponderosa pine. On this host the larvae bore through the bundle sheath and feed on the base of the developing needles. The adults proved to be one of many color phases of Cacoecia fumiferana (Clem.). In several other infested areas in the central Rocky Mountain region this insect appeared to be on the increase on the true firs and on Douglas fir. In Cody Canyon, in western Wyoming, there was a marked decline in the epidemic, which has continued there for a number of years on Douglas fir. In northern Minnesota and upper Michigan the form of the spruce budworm attacking jack pine caused less damage in 1937 than in 1936, although there was a continued spread of infested areas. (Division of Forest Insect Investigations, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

PANDORA MOTH:

An extensive outbreak of Coloradia pandora Blake was discovered this year in central Colorado, on the Arapaho National Forest, where lodgepole pine is being attacked and an area several miles in extent is already heavily defoliated. Apparently it has been many years since this species has occurred in an epidemic stage in Colorado. (J. A. Beal, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

WHITE FIR TUSSOCK MOTH

Epidemic outbreaks of Homocampa oslari Barnes occurred in the Inyo and Mono National Forests, central California, in 1936 and caused considerable defoliation of white fir east of the Sierra Nevada Mountains. This outbreak continued with similar intensity in 1937. The outbreak is of unusual interest, because no noticeable epidemics of this insect have been reported in the California region since 1906. (J. M. Miller, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

DOUGLAS FIR TUSSOCK MOTH

An outbreak of Homocampa pseudotsugae McD. near Hailey, Idaho, on the Sawtooth National Forest, which was recorded in 1936, increased in severity and size in 1937. A large percentage of the defoliated Douglas fir died during the season. An effort was made to establish colonies of Compsilura concinnata Meig. and Ephialtes examiner F., which was shipped from the New Haven, Conn., laboratory in July. (J. C. Evenden, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

WHITE FIR LOOPER

During 1937 outbreaks of Ellopiia fiscellaria lugubrosa Hlst. appeared throughout all of the northern Idaho and western Montana forests. This is the first available record of the insect appearing in epidemic form in this particular region. In 1936 moths appeared

in sufficient numbers to cause comment, though defoliation was not especially heavy. However, in 1937 thousands of acres of white fir and associated tree species were severely defoliated, and late in the season the adults appeared in tremendous numbers. (J. C. Evenden, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

ORIENTAL MOTH

The population of the oriental moth has definitely increased over 1936 in 5 of the 17 observation points located in Boston, Mass., and nearby suburban towns. The greatest increases are in Cambridge and Winthrop, and to a lesser degree in Revere and in two sections of Dorchester. In the other 12 observation points the conditions are similar to those of 1936. Although the cocoons of this insect are very abundant on shade and fruit trees in some localities, the heavy infestations in general are extremely local. Very little serious defoliation was caused by this insect last summer. Several hundred cocoons were recently collected and the prepupal larvae dissected. The results showed a decided general increase in parasitization by the introduced parasite Chaetexorista javana B. & B. (R. C. Brown, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

LARCH CASEBEARER

The larch casebearer continues as a serious menace to larch in the northeastern part of the United States. In 1937 larch trees all through the Adirondack section of New York showed a severe browning by this miner. In New England the mined needles were very noticeable in nearly every stand of larch, although in general the 1937 infestation seemed to be somewhat lessened in intensity from that of the last several years. Tree mortality has been rather high in some of the sample plots. (R. C. Brown, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

LODGEPOLE NEEDLE MINER

Recurvaria milleri Busck was in flight in the high Sierra areas of central California during July of 1937 and appeared in great numbers in the local areas where it has been developing in epidemic proportions since 1933. There was evidence of a slow spread from some of the areas where the infestation had reached its greatest intensity; in a few other areas where a high degree of parasitization was observed the outbreaks were apparently on the decline. (J. M. Miller, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

FIR BARK LOUSE

The fir bark louse increased in abundance in New England and New York in 1937, owing primarily to the wild weather last winter. Dead trees were more common this fall in Maine and New Hampshire than in 1936. In New York scouting has revealed a larger area of infestation extending south into the Catskill Mountains. Considerable mortality has occurred in the southern part of the Adirondack Mountains. Infested trees were found in two localities in Somerset County, N. J., in June 1937. (R. C. Brown, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

BEECH SCALE

A survey of sample plots in Maine indicates that there has been a definite increase in the infestation of the beech scale. In many instances the infestation was medium to heavy near the base of the trees in 1936 but at present it extends to distances of 25 to 50 feet from the ground. No marked increase in mortality of trees over 1936 was observed. The predator Chilocorus bivulnerus Muls. is apparently unable to check the progress of the infestation in Maine. The infestation in Scarsdale, N. Y., is now rather light. Chilocorus has been abundant here and apparently its feeding on the scale contributed largely to the checking of this particular infestation. (R. C. Brown, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

LOCUST LEAF MINER

The locust leaf miner was more abundant than usual in the Appalachian Mountains from Pennsylvania southward to North Carolina and Tennessee. There was a general browning of locust leaves and some forests looked as if they had been scorched by fire.

CATALPA SPHINX

The catalpa sphinx appeared in great abundance in the Ohio Valley from Illinois and western Kentucky and Tennessee to Pennsylvania, and on the eastern side of the Appalachian Mountains from New Jersey to South Carolina. Catalpa trees generally were defoliated. Late in the summer the parasite Apanteles congregatus (Say) became very noticeable over much of the infested territory. One report of injury was received from northern Mississippi.

BOXELDER BUG

The boxelder bug was first noted in the State of New Jersey by the writer in the fall of 1936, when it was reported as numerous in and about a house in Haddon Heights. A very large number of the

insects were seen in Haddonfield in yards having large boxelder trees. The owners stated that the bugs had been bothersome for the last 3 years. Determination was verified by H. G. Barber from specimens collected in this locality December 1936. (L. J. Bottimer, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

SCREWORM

In Texas the screwworm overwintered from the south edge of the escarpment between Devil's River, in Val Verde County, and D'Hanis, Medina County, and southward. Migration from this area began in March and by July 18 had reached a line from Oklahoma City to Amarillo, Tex., and Tucumcari, N. Mex. Dispersion eastward reached western Louisiana about July 1 and north-central Louisiana about August 15. The dispersion northward was slightly slower than last year, but slightly more rapid to the east. These migrations were rather uniformly progressive until the first of August, when the hot, dry weather to the north apparently stopped migration, as did the rather excessive rainfall in eastern Texas and Louisiana in August, September, and October. The build-up of populations began in the southernmost extremity of Texas and apparently reached peak at San Perlita, Willacy County, in the latter half of April. In the west Gulf plains area the peak was reached in the latter half of April and in the east Gulf plains area in the first half of July. Along the Lower Escarpment the peak was reached about the first half of July at Sanderson. Along the Upper Escarpment the peak was reached during the latter half of July at Sheffield. In the upper Gulf plains area and along the escarpment there was a decrease in the fly population in August, when there was no rainfall and the temperatures were abnormally high. A second peak was reached in September and October.

Comparing the population of screwworms in Texas this year with that of last year, the status trap at Uvalde indicated that in 1937 the catches amounted to 58 percent as many flies as 1936 and approximately 20 percent as many as in 1935. Activity ceased on November 18 at Uvalde, one month earlier than normal, on account of an abnormally cold period. In Arizona laboratory tests indicate that the insect did not overwinter at Tempe, and survey-trapping tests indicate that the fly was killed out in Arizona and evidently from 100 to 150 miles into Mexico. As indicated by standard trap catches and scouting for infested cases, the first fly appeared in the trap at Pozo Blanco on May 10. At approximately the same time or shortly afterwards the fly appeared in the eastern part of the area, along the Arizona-Mexico line to New Mexico. Migrations from these infestations were rather slow during the season and it is indicated that the fly did not reach the

escarpment along the Gila and Salt Rivers until late and did not pass the Divide into Little Colorado area during the season. The incidence of livestock infestations in Arizona was very much lighter than in 1936. (D. C. Parman, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

A very mild winter afforded screwworms a long season of activity in the Southeastern States. The lowest incidence of the pest occurred in Florida and Georgia during the last week of December and after that time it continued activity. The infestation in Georgia involved approximately the area in the southeastern part of that State, from a line drawn from Early to Washington Counties. Examinations of animals in counties north and east of the area known to be infested did not reveal new infestations except in one instance, when larvae were obtained in Fulton County on November 12. The infested area during the year in South Carolina comprised the southeastern quarter of the State, included within lines drawn from Barnwell to Sumter County and thence to Berkeley County. A widespread population in Florida was encountered early in the year. The lowest incidence occurred in December 1936 and in the following January 3,213 cases were reported from 54 counties, from Lafayette, Columbia, Union, and Hamilton Counties in the north as far south as Lee and Glades Counties. During the last two weeks of October, 1937, it was estimated that 40 cases of screwworms occurred in Houston County, Ala., near the Georgia boundary line. This county, as well as four other counties in the southeastern corner of the State, were scouted, but no further infestations were found.

STABLEFLY

Stableflies became seriously abundant in several States, notably in Iowa, Missouri, and Kansas.

In Mississippi stableflies were reported as moderately abundant throughout the winter of 1936-37 and more abundant in Washington County on April 15, 1937. By the middle of April they had begun to annoy cattle at Valdosta, Ga., and at Dallas, Tex. They became active in the central part of Iowa the last week in May. During the latter part of June they became seriously abundant in Kansas, in the central part of Missouri, and in Iowa, while in the eastern part of Nebraska cattle and horses were huddling in pastures for protection.

In central Iowa observations made by S. W. Simmons on 37 farms from June 28 to July 13 showed a serious abundance of stableflies, interfering greatly with farm operations. Mules, attacked more than

horses, could not be worked at times. Many farmers sprayed their horses three or four times a day and some carried sprayers into the fields with them.

In Missouri and Iowa the abundance continued through July. The pest was reported troublesome at Ocean City, Md., on July 28 and abundant in Kansas on June 26.

In south-central Kansas, H. O. Schroeder, reporting for the period July 23 to August 22, described the outbreak as the heaviest in 15 years. Horses and cattle became exhausted. Calves suffered open wounds at the joints of the legs and had raw areas along their backs. During the day many farmers protected their horses in darkened barns. Horses were worked with great difficulty, even while protected with nets and burlap. This extreme abundance followed a period of unusually heavy rainfall, from July 10 to 20.

Reports from Missouri and Iowa indicate some decline in abundance in August, followed by an increase in September. In Kossuth County, Iowa, on September 10, cattle in 10 or 15 pastures observed were huddling at the north fences for relief from stable-flies, relief being afforded by a strong, cool wind from the north. After September 16 the numbers in Iowa declined rapidly. (R. H. Wells, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

BOTFLIES

In the central part of Iowa all three species of horse bots, Gastrophilus nasalis L., G. haemorrhoidalis L., and G. intestinalis Deg., were much less abundant than during any of the preceding 4 years. The scarcity of G. nasalis and G. haemorrhoidalis was especially notable. G. intestinalis was reported active in Willacy County, Tex., on March 23; at Ames, Iowa, not until June 21; still active at Uvalde, Tex., on October 18; whereas, prior to 1936, they had been practically absent for several years. G. nasalis was reported active in Willacy County, Tex., on March 22; at Ames, Iowa, on June 10 and October 18; at Virginia Dale, Colo., on July 4; at Uvalde, Tex., on October 18. G. haemorrhoidalis was remarkably scarce all through the season in central Iowa. The species was reported active in Larimer County, Colo., on July 3. (R. H. Wells, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

BROWN DOG TICK

More than the usual number of reports of occurrence of the brown dog tick were received during the year. Reports were received from Denver, Colo., New Haven, Conn., Waukegan, Ill., Townson, Md., and Douglas County, Nebr.

BROWN-BANDED COCKROACH

The brown-banded cockroach (Supella supellec[t]ilium Serv.) is now so definitely established in the United States that it should no longer be omitted from our economic literature. In recent publications 1/, 2/ the pest is illustrated and compared with other species. E. D. Ball wrote recently that S. supellec[t]ilium had been established in Tucson, Ariz., for about 3 years and that he had sent specimens to M. Hebard, who states 3/ that these specimens are the first from the Southwestern States to be received by him. In his letter Dr. Ball also states that this cockroach has been taken since 1935 in Arizona at Phoenix, San Carlos Indian Reservation, Bisbee, and Douglas and that a correspondent stated that it is the only cockroach he has not been able to successfully handle in the house.

A commercial exterminator company in Atlanta, Ga., wrote in December, 1937, that an infestation was found in a house in Athens, Ga. G. E. Gould reported the species found in October 1937 at Bloomington, Ind.

In December 1937, K. Cook reported combating an infestation in Worcester, Mass. J. J. Davis reports having received specimens from a pest-control operator in Denver, Colo., in October 1937. F. E. Cairns, Mazomanie, Wis., sent specimens on April 20, 1937, from his home to C. L. Fluke at Wisconsin State University, where they were identified as this species by H. C. Severin. In further correspondence with Mr. Fluke, it was learned that the infestation was very active and that in recent years Mr. Cairns' family had made a trip to Texas and the Gulf.

On November 6, 1937, J. L. Calhoun, San Angelo, Tex., wrote that this roach is a serious pest in homes at that place and sent a large collection of specimens in alcohol. He wrote on November 26, 1937, that this roach is never seen in his home except in the kitchen, where it likes to hide about the sink and in pot-and-pan cabinets. In other houses it infests various rooms congregating in upholstered and other furniture in the daytime. The San Carlos Agency, San Carlos, Ariz., sent specimens to the Office of Indian Affairs, United States Department of Interior, with the statement that during 1937 this species was becoming a great pest at the Indian Agency.

To date Supella supellec[t]ilium has been recorded from the following places: Florida--Key West (1903), Miami (1903), Daytona Beach (1936), Jacksonville (1936); Georgia--Savannah (1936), Atlanta (1932-37), Athens (1937); Alabama--Auburn (1934), Birmingham (1936-37);

- 1/ E. A. Back, Proc. Ent. Soc. Wash., vol. 39, pp. 205-213, November 1937.
- 2/ E. A. Back, U. S. Dept. Agr. Leaflet 144, 6 pp., 1937
- 3/ M. Hebard, Trans. Amer. Ent. Soc. vol. 61, p. 273, September 1935.

Mississippi--Cleveland (1937); Louisiana--Shreveport (1935); Texas--Austin (1931), Dallas (1937), Houston (1937), San Angelo (1931-37), San Antonio (1927); Arizona--Tucson (1935-37), San Carlos Indian Reservation (1937), Fisbee (1937), Phoenix (1937), Douglas (1937); Oklahoma--Ada (1937), Tulsa (1937), Oklahoma City (1937); Wisconsin--Mazomanie (1937); Missouri--Kansas City (1937); Nebraska (1929); Illinois--Urbana (1933), Chicago (1937); Indiana--Bloomington (1937), Indianapolis (1937); Massachusetts--Worcester (1937).

As this roach has such a wide distribution throughout the South and has demonstrated its ability to survive and multiply in northern cities and towns, new distribution records may be expected to increase rapidly. Cockroaches are so easily concealed in household effects and baggage carried quickly in automobiles from the South to the North that all entomologists and pest-control operators should combine efforts to obtain the proper identification of all cockroach adults that do not exceed 5/8 inch in length and possess wings with two light-brown or yellowish cross bands. Blattella germanica L. is the only roach in the United States that is likely to be confused with this species. (E. A. Back, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

Corrections.--The identification of the mite published as Tetranychus telarius L., in the Insect Pest Survey Bulletin, vol. 17, p. 284, 1937, has been changed to T. pacificus McG.

The rabbit tick (Haemaphysalis leporis-palustris Pack.), reported by M. H. Swenk, in vol. 17, p. 424, has been changed to the brown dog tick (Rhipicephalus sanguineus Latr.).

The spruce budworm (Cacoecia fumiferana Clem.), reported by L. H. Noble, in vol. 17, p. 417, has since been identified as Diprion polytomum Htg.

The identification of the sawfly, reported as Hemichroa pacifica Rohw. (vol. 17, p. 413) was in error. The insect is H. washingtonia Rohw. and Midd. There is no H. pacifica.

The report on cowpea weevils by Z. P. Metcalf (vol. 17, p. 49) published as Chalcodermus aeneus Foh., should be Callosobruchus maculatus F.

An error in a note published in vol. 16, p. 376, 1936, has come to our attention. The note on Tarsonemus floricolus C. and F., credited to F. F. Smith, should have been credited to A. C. Davis.

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	6	296
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	9	442
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	5	208,239
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<i>Phasnidæ</i> -----	8	416
	9	457
<i>Phara obtusifrons</i> Fowl. -----	9 (Sup.)	555
<i>Philibetron quadrimaculatum</i> Thos. -----	3 (Sup.)	120,128-150
<i>Phlyctaenia rubigalis</i> (Guen.) -----	1	19
	7	374
<i>Phobetrus hipparchia</i> Grah. -----	9 (Sup.)	576
<i>Phoctelites nebrascensis</i> Thos. -----	3 (Sup.)	128,132,135
		136,144,148
<i>Pholus fasciatus</i> Drury -----	9 (Sup.)	576
<i>Phorri</i> sp. -----	3	106
<i>Phorodon humuli</i> (Schr.) -----	5	233
<i>Photinus volcanicus</i> Gorb. ? -----	9 (Sup.)	504
<i>Phthia lunata</i> (F.) -----	9 (Sup.)	518
<i>Phthia picta</i> (Drury) -----	9 (Sup.)	518
<i>Phyllobius oblongus</i> L. -----	6	320
<i>Phyllocoptes oleivorus</i> Ashm. -----	1	15
	2	54
	4	177
	5	235
	6	291
	7	353
	8	401
<i>Phyllocoptes quadripes</i> Shim. -----	4	196
<i>Phyllophaga arkansana</i> Schffr. -----	3	73
<i>Phyllophaga bipartita</i> Horn -----	3	73
<i>Phyllophaga calceata</i> Lec. -----	2	46
	3	73
<i>Phyllophaga congrua</i> Lec. -----	3	73
<i>Phyllophaga crassissima</i> (Blanch.) -----	3	73

Phyllophaga ephilida (Say) -----	7	339
Phyllophaga fervida (F.) -----	4	158
Phyllophaga fraterna Harr. -----	4	158
Phyllophaga fusca (Froel.) -----	4	158
Phyllophaga hirticula (Knoch) -----	4	158
Phyllophaga hirtiventris Horn -----	2	46
	3	73
Phyllophaga inversa Horn -----	4	158
Phyllophaga lanceolata (Say) -----	5	215
	9	441
Phyllophaga micans (Knoch) -----	3	73
Phyllophaga praetermissa Horn -----	3	73
Phyllophaga profunda (Blanch.) -----	3	73
Phyllophaga prunina Lec. -----	3	73
Phyllophaga rubiginosa Lec. -----	3	73
Phyllophaga spp. -----	2	46
	3	69, 72-73
	4	151, 158
	5	207, 210, 214-215
	8	387
Phyllophaga submucida Lec. -----	3	73
Phyllophaga tristis (F.) -----	3	73
	4	158
	5	214
Phyllotoma nemorata Fall. -----	8	414
	9	457
Phyllotreta pusilla Horn -----	5	237
Phyllotreta vittata (F.) -----	1	19
	5	237
Phylloxera caryaecaulis Fitch -----	6	319
Phylloxera sp. -----	6	290
Phylloxera vitifoliae Fitch -----	6	290
Physostegania pustularia Guen. -----	5	248
Phytomyza chrysanthemi (Kowarz) -----	6	323
Phytomyza illicicola Loew -----	4	200
Phytophaga destructor (Say) -----	2	47
	3	69, 75
	5	219
	6	279
	7	335, 342
	7 (Sup.)	381-383
	8	385, 387, 392
	9	435, 440
	10	600-601
Phytorus pinguis Baly -----	9	471
Pieris clodia Bdv. -----	9 (Sup.)	576
Pieris monusta L. -----	4	161
Pieris rapae (L.) -----	1	18
	2	56
	3	93
	4	182
	5	242
	6	264, 298-299
	7	358
	8	404
	10	611-612

<i>Pieris</i> sp. -----	1	8
<i>Pisana cinerea</i> (Say) -----	9 (Sup.)	534
<i>Pisodorus guildinii</i> (Westw.) -----	9 (Sup.)	529
<i>Pineus strobil</i> Htg. -----	6	322
<i>Pissodes deodarae</i> Hopk.		
<u>See</u> <i>P. nemorensis</i> Germ.		
<i>Pissodes nemorensis</i> Germ. -----	1	24
<i>Pissodes strobil</i> (Peck) -----	6	321-322
	7	371
<i>Plagiodera bis-tripunctata</i> Duvivier? -----	9 (Sup.)	500
<i>Plagiodera congesta</i> Stal -----	9 (Sup.)	500
<i>Plagiodera versicolora</i> (Laich.) -----	5	254
	6	322
	8	418
<i>Plagiognathus politus</i> Uhl. -----	8	419
<i>Plateros evanides</i> Gorb. -----	9 (Sup.)	506
<i>Plateros ochraceus</i> Gorb. -----	9 (Sup.)	506
<i>Plathypena scabra</i> (F.) -----	4	168
	8	388, 395
<i>Platybregmus canadensis</i> Fisher -----	5	209, 261
<i>Platymetopius frontalis</i> Van D. -----	9 (Sup.)	555-556
<i>Platytyllus latipennis</i> (Stal) -----	9 (Sup.)	525
<i>Plectris aliena</i> Chapin -----	4	199
<i>Plectrodera scutator</i> F. -----	6	322
	7	372
<i>Plodia interpunctella</i> (Hbn.) -----	9	469
<i>Plutella maculipennis</i> (Curt.) -----	1	6, 17, 25
	2	56
	3	93
	4	182
	5	242-243
	6	266, 299
	7	358
	9	451-452
	9 (Sup.)	576
	10	611-612
<i>Podisus congre</i> (Stal) -----	9 (Sup.)	530, 572
<i>Podisus lineolatus</i> (H.-S.) -----	9 (Sup.)	530
<i>Podisus thetis</i> (Stal) -----	9 (Sup.)	530
<i>Podosesia syringae</i> (Harr.) -----	4	200
	6	325
	8	421
<i>Pogonomyrmex barbatus</i> (F. Smith) -----	3	110
	6	330
<i>Pogonomyrmex occidentalis</i> Cress. -----	3	110
<i>Polistes</i> sp. -----	6	307
<i>Polybia fasciata</i> Sauss. -----	9 (Sup.)	587
<i>Polychrosis vitreana</i> (Clem.) -----	6	289
	7	351
	9	435, 446
<i>Polyglypta costata</i> Burm. -----	9 (Sup.)	570
<i>Polyglypta dispar</i> Fowl. -----	9 (Sup.)	570

Polymerus cuneatus (Dist.) -----	9 (Sup.)	525
Popillia japonica Newm. -----	4	157
	5	215
	6	263,273
	7	339-340
	8	390,391
	9	439
	9 (Sup.)	473-482
	10	606-607
Porosagrotis orthogonia (Morr.) -----	3	74
	4	160
	5	207,217-218
	6	275
Porthetria dispar (L.) -----	1	22
	4	194
	5	209,250
	6	264,313
	9	456
	10	618-619
Potnia brevicornis Fowl. -----	9 (Sup.)	570
Prionoxystus robiniae (Peck) -----	6	319
	7	368
Prionus californicus Mots. -----	1	15
	2	54
Prionus heroicus Semen. -----	2	54
Pristiphora geniculata Htg. -----	10	622
Prociphilus tessellatus (Fitch) -----	7	370
Prodenia eridania (Cram.) -----	2	46
Prodenia ornithogalli Guen. -----	5	217,218
	6	275
	7	340
Prodenia praefica Grote -----	7	341
Prolimacodes triangulifera Schaus -----	9 (Sup.)	577
Prosenia siberita F. -----	9 (Sup.)	473
Protalebra decorata (Osb.) -----	9 (Sup.)	556
Protalebra signata McA. -----	9 (Sup.)	556
Proteoteras aesculana Riley -----	6	320
Protoparce quinque maculata (Haw.) -----	6	307
	9	436,454
	10	611-614
Protoparce sexta (Johan.) -----	4	188
	6	294-295,307
	10	613-614
Protoparce spp. -----	4	187-188
	5	247
	7	356,360
	8	386,402,407
Protopulvinaria pyriformis Ckll. -----	9 (Sup.)	560
Proxys punctulatus (Beauv.) -----	9 (Sup.)	530
Psalis americana (Beauv.) -----	9 (Sup.)	569

<i>Psallus seriatus</i> (Reut.) -----	1	21-22
	2	60
	3	70, 99
	4	191-192
	5	208, 256-257
	6	264, 309-310
	7	336, 364-365
	8	411
	10	616
<i>Pseudaonidia paeoniae</i> Ckll. -----	3	103
	4	199
<i>Pseudaonidia articulatus</i> Morg. -----	9 (Sup.)	560
<i>Pseudischaspis bowreyi</i> (Ckll.) -----	9 (Sup.)	560
<i>Pseudococcus citri</i> (Risso) -----	5	235
	9	461
	9 (Sup.)	560
<i>Pseudococcus comstocki</i> Kuw. -----	9	445
<i>Pseudococcus longispinus</i> (Targ.) -----	9 (Sup.)	560
<i>Pseudococcus maritimus</i> (Ehrh.) -----	3	104
<i>Pseudococcus</i> spp. -----	1	24
<i>Pseudococcus virgatus</i> (Ckll.) -----	9 (Sup.)	560
<i>Pseudomesomphalia isthmica</i> (Champ.) -----	9 (Sup.)	500
<i>Pseudomesomphalia pictilis</i> (Boh.) -----	9 (Sup.)	500
<i>Pseudopomala brachytera</i> Scudd. -----	3 (Sup.)	147
<i>Psila rosae</i> (F.) -----	1	19-20
	2	58
	5	245
	6	303
<i>Psilothrips</i> sp. -----	7	374
<i>Psinidia fenestralis fenestralis</i> Serv. -----	3 (Sup.)	148
<i>Psyllia buxi</i> (L.) -----	3	103
<i>Psyllia pyricola</i> (Foerst.) -----	3	87
	4	175
	5	232
<i>Psylliodes punctata</i> Melsh. -----	4	187
	5	210
<i>Pterichthya longicauda</i> Bates -----	9 (Sup.)	487
<i>Pteronidea ribesii</i> (Scop.) -----	5	234
<i>Pterygia bituberculata</i> Fowl. -----	9 (Sup.)	570
<i>Pterygia cerviceps</i> Fowl. -----	9 (Sup.)	570
<i>Ptilodactyla maculata</i> Champ. -----	9 (Sup.)	503
<i>Ptimus brunneus</i> Duft. -----	9	469
<i>Ptimus latefasciatus</i> Gorch. -----	9 (Sup.)	502
<i>Ptimus tectus</i> Boieldieu -----	8	428
<i>Pulvinaria psidii</i> Mask. -----	9 (Sup.)	560
<i>Pulvinaria vitis</i> (L.) -----	4	196
	5	252-253
	6	319
	7	371
<i>Pycnoderes atratus</i> (Dist.) -----	9 (Sup.)	525
<i>Pycnoderes incurvus</i> (Dist.) -----	9 (Sup.)	525
<i>Pycnoderes quadrimaculatus</i> Guer. -----	9 (Sup.)	525
<i>Pycnopalpa bicordata</i> (Serv.) -----	9 (Sup.)	581

Pyrausta ainslei Heinr. -----	5	241
Pyrausta cerata F. -----	9	470
Pyrausta nubilalis (Hbn.) -----	3	78
	5	223
	6	263,265,280-281,305
	7	335,344
	8	385,393-394
	8 (Sup.)	431-433
	10	601
Pyrodes rhomboderus (Bates) -----	9 (Sup.)	487
Quesada gigas (Oliv.) -----	9 (Sup.)	557
Recurvaria milleri Busck -----	8	416
	10	626
Reticulitermes flavipes Koll. -----	3	109
	4	205
Reticulitermes hesperus Banks -----	4	205
	9	468
Reticulitermes spp. -----	1	26-27
	2	67
	3	109
	4	205
	6	330
	8	427
	9	467-468
Reticulitermes tibialis Banks -----	4	205
	9	467
Reuteroscopus ornatus (Reut.) -----	9 (Sup.)	525
Rhabdophaga batatus Walsh -----	8	418
Rhabdopterus jansoni Jacoby -----	9 (Sup.)	501
Rhagoletis cingulata (Loew) -----	5	233
Rhagoletis completa Cress. -----	9	435,447
Rhagoletis fausta O. S. -----	5	232,233
Rhagoletis pomonella (Walsh) -----	5	230
	6	287
	7	349,351
	9	435,443-444
Rhinochenus stigma (L.) -----	9 (Sup.)	514
Rhinospathe albomarginata Chev. -----	9 (Sup.)	514
Rhipicephalus sanguineus (Latr.) -----	3	424
	9	465
	10	630,632
Rhipipteryx biolleyi Sauss. -----	9 (Sup.)	561,581
Rhipipteryx tricolor Sauss. -----	9 (Sup.)	581
Rhizoecus coffeae Laing -----	9 (Sup.)	560
Rhizoglyphus hyacinthi Bdv. -----	3	105
	4	200
Rhizopertha dominica F. -----	2	67
Rhodites nodulosus Beut. -----	4	201
Rhodites rosae (L.) -----	7	375
Rhodobaenus cinctus Gyll. -----	9 (Sup.)	514
Rhodobaenus tredocimpunctatus Ill. -----	7	374
Rhopalosiphum prunifoliae (Fitch) -----	3	80
	4	172
	8	393

<i>Rhopal. siphum pseudobrassicae</i> -----	1	19
	2	58
	3	95
	8	406
	9	452-453
	9 (Sup.)	537
<i>Rhopobata naevana</i> (Hbn.) -----	4	176
<i>Rhyacionia buoliana</i> (Schiff.) -----	3	101
	4	197
	5	253
	6	267
	7	371
	8	416
<i>Rhyacionia frustrana</i> Comst. -----	2	62
	3	102
	8	416
<i>Rhynchites bicolor</i> (F.) -----	6	326
<i>Rhynchophorus palmarum</i> (L.) -----	9 (Sup.)	514
<i>Rhynchosciara brevicornis</i> Rubs.? -----	9 (Sup.)	585
<i>Rhyncholea microptera</i> (Beauv.) -----	5	213
<i>Saissetia hemisphaerica</i> (Targ.) -----	9 (Sup.)	561
<i>Saissetia nigra</i> (Nietn.) -----	9 (Sup.)	561
<i>Saissetia oleae</i> (Bern.) -----	1	14
	9 (Sup.)	561
<i>Sangaria hargi</i> Harold ? -----	9 (Sup.)	501
<i>Saperda candida</i> F. -----	2	51
	7	348
	8	397
<i>Saperda tridentata</i> Oliv. -----	9	458
<i>Saperda vestita</i> Say -----	5	252
<i>Sarcophaga kellyi</i> Ald. -----	6	269, 270
<i>Scaptoriscus acletus</i> R. & H. -----	3	94
<i>Scaptoriscus</i> spp. -----	1	21
	3	97
<i>Scaptoriscus vicinus</i> Scudd. -----	7	355
<i>Schistocerca alutacea alutacea</i> ? Harr. -----	3 (Sup.)	148
<i>Schistocerca alutacea lineata</i> Scudd. -----	3 (Sup.)	148
<i>Schistocerca americana</i> (Drury) -----	6	268, 271
<i>Schistocerca americana americana</i> (Drury) -----	3 (Sup.)	148
<i>Schistocerca impleta</i> Walk. -----	9 (Sup.)	581-582
<i>Schistocerca lineata</i> Scudd. -----	3 (Sup.)	128, 135, 138, 140
	8	389
<i>Schistoceros hamatus</i> (F.) -----	7	375
<i>Schizura concinna</i> (S. & A.) -----	7	348
<i>Schizonicus pennsylvanicus</i> Champ. -----	9 (Sup.)	510
<i>Sciara sexdentata</i> Petty -----	1	20
<i>Scirtothrips citri</i> (Moult.) -----	3	89
	4	177
	8	400
<i>Scolytus multistriatus</i> Marsham -----	10	620
<i>Scolytus rugulosus</i> Ratz. -----	4	174
	6	284
	7	346
	9	446

Scopiorus mucronatus S. & P. -----	9 (Sup.)	582
Scutigera forceps Raf. -----	3	110
	4	206
Scutigerella immaculata (Newp.) -----	5	239
Scymnus horni Gorh. -----	9 (Sup.)	502
Scyphophorus interstitialis Gyll. -----	9 (Sup.)	514
Semiotus superbus Kirsch. -----	9 (Sup.)	503
Sesia rhododendri Beutm. -----	3	105
Sibine ophelians Dyar ? -----	9 (Sup.)	577
Sibine stimulea (Clem.) -----	8	423
	9	464
Sinea raptoria Stål -----	9 (Sup.)	533
Sitophilus oryzae (L.) -----	2	67
	3	87
	9 (Sup.)	514
Sogata furcifera Horv. -----	9 (Sup.)	563
Solenopsis geminata (F.) -----	2	67
	9 (Sup.)	536, 558, 560, 561, 565, 568, 570, 587
Solenopsis molesta (Say) -----	5	226
Solenopsis xyloni McCook -----	3	109
Spangberrella mexicana Bak. -----	9 (Sup.)	556
Spharagemon bolli Scudd. -----	3 (Sup.)	148
Spharagemon collare Scudd. -----	3 (Sup.)	120-148
Spharagemon equale Say -----	3 (Sup.)	120-148
Sphinx kalmiae A. & S. -----	6	317
Sphinx lineata F. -----	2	46
	3	74
	6	263, 276-277
	7	341
	8	392
	9	439
Spilonota ocellana (D. & S.) -----	3	83
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Statira tropicalis Champ. -----	9 (Sup.)	504
Steirarrhinus cupreotinctus Champ. -----	9 (Sup.)	514
Steirarrhinus sp. -----	9 (Sup.)	514
Stenodema guatemalana (Dist.) -----	9 (Sup.)	525
Stenoma annonella Sepp. -----	9 (Sup.)	577
Stenoma sororia (Zell.) -----	9 (Sup.)	577
Stenomacra marginella (H.-S.) -----	9 (Sup.)	532-533
Stenotarsus flavago Gorh. -----	9 (Sup.)	503
Stephanitis pyrioides Scott -----	7	373
Stephanitis rhododendri Horv. -----	5	259
	6	326
	7	374
	8	421
Stictocephala festina (Say) -----	2	49
	6	283
	9 (Sup.)	571

<i>Stictopelta acutula</i> (Fairm.) -----	9 (Sup.)	571
<i>Stilpnochloa azteca</i> (Sauss.) -----	9 (Sup.)	582
<i>Stilpnotia salicis</i> (L.) -----	5	250
	6	267, 314
	7	367
	10	619
<i>Stirellus bicolor</i> (Van D.) -----	9 (Sup.)	556
<i>Stomoxys calcitrans</i> (L.) -----	3	107
	5	261
	6	329
	7	336, 377
	8	426-427
	9 (Sup.)	585
	10	629-630
<i>Stratiomyia subalba</i> Bellardi -----	9 (Sup.)	585
<i>Strigoderma arboricola</i> F. -----	5	238
<i>Strigoderma rutelina</i> Bates -----	9 (Sup.)	509
<i>Strongylium permodicum</i> Maklin ? -----	9 (Sup.)	510
<i>Supella supellectilum</i> Serv. -----	3	110
	10	631-632
<i>Synanthedon</i> See <i>Conopia</i> .		
<i>Syntames chiriquensis</i> Fowl. -----	9 (Sup.)	564
<i>Syntechna tarasca</i> (Sauss.) -----	9 (Sup.)	582
<i>Syntomaspis druparum</i> Boh. See <i>Callimome</i> <i>druparum</i> (Boh.)		
<i>Syntomeida epialis</i> Walk. -----	6	325
<i>Syrbula admirabilis</i> Uhl. -----	3 (Sup.)	147
<i>Sysinas centralis</i> Dist. -----	9 (Sup.)	525
<i>Systema blanda</i> Melsh. -----	5	237
	7	354
<i>Systema elongata</i> F. -----	6	324
<i>Systema s-littera</i> (L.) -----	9 (Sup.)	501
<i>Systema ustulata</i> Harold -----	9 (Sup.)	501
<i>Tachycines asynanorus</i> Adel. -----	1	23
<i>Taeniopoda centurio</i> (Drury) -----	9 (Sup.)	583
<i>Taeniopoda varipennis</i> Rehn -----	9 (Sup.)	583
<i>Taeniothrips inconsequens</i> (Uzel) -----	2	53
	5	210
<i>Taeniothrips simplex</i> Morison -----	3	104
	4	200
	5	258
	6	324
	8	421
	9	463
<i>Taeniothrips xanthus</i> Williams -----	1	25
<i>Taniva albolineana</i> Kearf. -----	5	254
<i>Tarsonemus floridulus</i> C. & F. -----	10	632
<i>Tarsonemus pallidus</i> Banks -----	5	259
	6	324
<i>Tarsonemus</i> sp. -----	2	59
<i>Tatua latus</i> (Cuvier) -----	9 (Sup.)	587
<i>Telegonus alardus</i> (Stoll) -----	9 (Sup.)	577
<i>Teleonemia sacchari</i> (F.) -----	9 (Sup.)	534

Telephanus grossicornis Nevermann -----	9 (Sup.)	502
Telephanus melanchlorus Nevermann -----	9 (Sup.)	502
Tenebrio obscurus F. -----	7	379
Tenodera sinensis Sause. -----	8	418
Teretilanguria metallica Gornh. -----	9 (Sup.)	505
Tetralopha melanogrammos Zell. -----	5	253
Tetranychus pacificus McG. -----	8	398
	10	632
Tetranychus sexmaculatus Riley -----	4	177
Tetranychus telarius (L.) -----	1	8
	2	47
	6	284
	9 (Sup.)	590
	10	632
Tetraeuaresta obscuriventris (Loew) -----	9 (Sup.)	585
Thagana tibialis Walk. -----	9 (Sup.)	577
Thamnotettix conatus (Ball) -----	9 (Sup.)	556
Thamnotettix fasciaticollis (Stal) -----	9 (Sup.)	556
Thionia variegata Stal -----	9 (Sup.)	564
Thrips tabaci Lind. -----	1	19
	2	57
	3	94
	4	186
	5	245
	6	303-304
	7	374
	9 (Sup.)	588
Thyanta perditor (F.) -----	9 (Sup.)	530
Thylodrias contractus Mots. -----	1	28
	3	110
Thyreocoris guttiger Stal -----	9 (Sup.)	519
Thyridopteryx epheneraeformis (Haw.) -----	5	250-251
	6	264, 316-317
	7	366
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	5	208, 257-258
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Tiphia popilliavora Roh. -----	9 (Sup.)	474, 479-481
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Tipulidae -----	4	161
Tolyte celeste Dyar -----	9 (Sup.)	577
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Tomaspis bipunctata Say -----	9 (Sup.)	538
Tomaspis lineata (Walk.) ? -----	9 (Sup.)	538
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Toxoptera graninum Rond. -----	1	5, 9-10
	2	43, 47-48
	3	76
Toxotrypana curvicauda Gerst. -----	9 (Sup.)	585
Trachelus tabidus (F.) -----	3	77
	8	393
Trachyderes succinctus L. -----	9 (Sup.)	487
Trialeurodes abutilonea Hald. -----	10	612

<i>Trialeurodes vaporariorum</i> (Westw.) -----	1	24
<i>Triaspis thoracicus</i> Curt. -----	10	604
<i>Triatoma protracta</i> Uhl. -----	6	327
<i>Tribolium confusum</i> Duv. -----	9	469
<i>Tribolium madens</i> Charpentier -----	6	330
<i>Trichobaris mucorea</i> (Lec.) -----	5	240
<i>Trichobaris trinitata</i> (Say) -----	6	297
<i>Trichogramma minutum</i> Riley -----	5	226
<i>Trichogramma</i> sp. -----	5	225
	6	284
	7	345
	10	604
<i>Trifidaphis phaseoli</i> Pass. -----	6	307
<i>Trigona amalthea</i> (Oliv.) -----	9 (Sup.)	587
<i>Trigona cupira</i> Smith -----	9 (Sup.)	587
<i>Trigona ruficrus corvina</i> Cr. -----	9 (Sup.)	587
<i>Trigona silvestriana</i> Vachal -----	9 (Sup.)	587
<i>Trimerotropis agrestis</i> McNeill -----	3 (Sup.)	138
<i>Trimerotropis campestris</i> McNeill -----	3 (Sup.)	120,128,132
<i>Trimerotropis citrina</i> (atypic) Scudd. -----	3 (Sup.)	148
<i>Trimerotropis lacticincta</i> Sauss. -----	3 (Sup.)	120,138,148
<i>Trimerotropis pallidipennis</i> Burn. -----	3 (Sup.)	128,138,144
<i>Trimerotropis pistrinaria</i> Sauss. -----	3 (Sup.)	128,144
<i>Trimerotropis sparsa</i> Thos. -----	3 (Sup.)	128
<i>Trimerotropis</i> spp. -----	3 (Sup.)	137,138
	5	212
<i>Trimerotropis vinculata</i> Scudd. -----	3 (Sup.)	137,138
	4	155
<i>Trionymus sacchari</i> Ckll. -----	9 (Sup.)	561
<i>Trioza nicaraguensis</i> Crawf. -----	9 (Sup.)	538
<i>Trioza tripunctata</i> (Fitch) -----	5	234
<i>Triphleps tristicolor</i> White -----	9 (Sup.)	515
<i>Tripoxylon rugifrons</i> Cameron -----	9 (Sup.)	587
<i>Troctes divinatorius</i> Mull. -----	9	470
<i>Trombicula irritans</i> Riley -----	6	327
<i>Tylopelta gibbera</i> (Stal) -----	9 (Sup.)	571
<i>Typhaea fumata</i> L. -----	6	330
	7	353
<i>Typhlocyba pomaria</i> McAtee -----	4	172-173
	5	229-230
	6	286
	8	396
	9	444
<i>Typhlocybella minima</i> Bak. -----	9 (Sup.)	557
<i>Tyrophorus viridicyaneus</i> Cr. -----	1	6,20
<i>Unbonia crassicornis</i> (An. & Serv.) -----	9 (Sup.)	571
<i>Uroplata uterrina</i> Guer. ? -----	9 (Sup.)	501
<i>Utetheisa bella</i> L. -----	1	7
<i>Utetheisa ornatrix</i> (L.) -----	9 (Sup.)	577
<i>Vanduzeei segmentata</i> Fowl. -----	7	374
	9 (Sup.)	571
<i>Vespa crabro</i> L. -----	9	463
<i>Vespula squicidae</i> (Hy. Edw.) -----	8	416

Volucella purpurifera Bigot -----	9 (Sup.)	585
Volucella tricineta Bigot -----	9 (Sup.)	585
Wasmannia auro-punctata Roger -----	5	261
Xanthophagus solskyi Sharp. -----	9 (Sup.)	509-510
Xenochalepus amplipennis (Baly) -----	9 (Sup.)	501
Xenochalepus onogorus (Crotch) -----	9 (Sup.)	501
Xenochalepus waterhousi (Baly) -----	9 (Sup.)	501
Xenopsylla cheopis (Rothsch.) -----	9 (Sup.)	589
Xestobium rufovillosum Deg. -----	9	469
Xestocephalus tessellatus Van D. -----	9 (Sup.)	557
Xyletinus peltatus Harr. -----	8	429
Xylocopa frontalis (Oliv.) -----	9 (Sup.)	587
Xylotrechus nauticus Mann. -----	5	235
Zicca commaculata Dist. -----	9 (Sup.)	518
Zicca taeniola (Dallas) -----	9 (Sup.)	518
Zonarius jansoni Crotch -----	9 (Sup.)	503
Zopherus costaricensis Champ. -----	9 (Sup.)	511

We wish to urge our collaborators to use the common names accepted by the American Association of Economic Entomologists. They are indicated by the letters a.n.o. (Americano nomina officinale).

Abbot's sawfly -----	Neodiprion abbotti Leach
Alfalfa caterpillar a.n.o. -----	Eurymus eurythene (Bdv.)
Alfalfa looper a.n.o. -----	Autographa californica (Speyer)
Alfalfa weevil a.n.o. -----	Hypera postica (Gyll.)
American dog tick a.n.o. -----	Dermacentor variabilis (Say)
Apple and thorn skeletonizer a.n.o. -----	Hemerophila periana (Clerck)
Apple aphid a.n.o. -----	Aphis pomi Deg.
Apple flea weevil a.n.o. -----	Orchestes pallicornis Say
Apple grain aphid a.n.o. -----	Rhopalosiphum prunifoliae (Fitch)
Apple maggot a.n.o. -----	Rhagoletis pomonella (Walsh)
Apple seed chalcid a.n.o. -----	Callinome druparum Boh.
Apple twig borer a.n.o. -----	Schistoceros hamatus F.
Arborvitae aphid -----	Lachnus thujaefilina Del Guer.
Arborvitae leaf miner a.n.o. -----	Argyresthia thuiella (Pack.)
Argentine ant a.n.o. -----	Iridomyrmex humilis Mayr
Army cutworm a.n.o. -----	Chorizagrotis auxiliaris (Grote)
Armyworm a.n.o. -----	Cirphis unipuncta (Haw.)
Asiatic garden beetle a.n.o. -----	Autoserica castanea (Arrow)
Asparagus beetle a.n.o. -----	Crioceris asparagi (L.)
Avocado red mite a.n.o. -----	Paratetranychus yothersi McG.
Azalca lacebug -----	Stephanitis pyricoides Scott
Azalea scale -----	Eriococcus azalae Const.
Bagworm a.n.o. -----	Thyridopteryx ephemeraeformis (Haw.)
Balsam bark beetle -----	Dryocoetes confusus Swaine
Banded ash borer -----	Neoclytus caprea (Say)
Banded cucumber beetle a.n.o. -----	Diabrotica balteata Lec.
Bean aphid a.n.o. -----	Aphis rumicis L.
Bean leaf beetle a.n.o. -----	Cerotoma trifurcata (Forst.)
Bean leaf skeletonizer a.n.o. -----	Autographa egeria (Guen.)

Bear tarips a.n.o.	-----	Heliothrips fasciatus Perg.
Bear weevil a.n.o.	-----	Acanthoscelides obtectus (Say)
Bedbug a.n.o.	-----	Cimex lectularius L.
Beech scale a.n.o.	-----	Cryptococcus fagi (Baer.)
Beet armyworm a.n.o.	-----	Laphygma exigua (Hbn.)
Beet leafhopper a.n.o.	-----	Eutettix tenellus (Bak.)
Beet webworm a.n.o.	-----	Loxostege sticticalis (L.)
Bella moth	-----	Utetheisa bella L.
Birch leaf miner	-----	Fenusa pumila Klug
Birch leaf-mining sawfly	-----	Phyllotoma nemorata Fall.
Birch skeletonizer a.n.o.	-----	Bucculatrix canadensisella Chamb.
Blackberry leaf miner	-----	Metallus rubi Forbes
Black blister beetle a.n.o.	-----	Epicauta pennsylvanica (Deg.)
Black carpenter ant a.n.o.	-----	Camponotus herculeanus pennsylvanicus (Deg.)
Black cherry aphid a.n.o.	-----	Myzus cerasi (F.)
Black grain stem sawfly a.n.o.	-----	Trachelus tabidus (F.)
Black-headed budworm a.n.o.	-----	Peronea variana (Fern.)
Black-headed fireworm a.n.o.	-----	Rhopobota naevana (Hbn.)
Black Hills beetle a.n.o.	-----	Dendroctonus ponderosae Hopk.
Black peach aphid a.n.o.	-----	Anuraphis persicae-niger (Smith)
Black scale a.n.o.	-----	Saissetia oleae (Bern.)
Black turpentine beetle a.n.o.	-----	Dendroctonus terebrans (Oliv.)
Black vine weevil a.n.o.	-----	Brachyrhinus sulcatus (F.)
Black widow spider a.n.o.	-----	Latrodectus mactans F.
Blackberry mite	-----	Eriophyes essigi Hassan
Blueberry maggot a.n.o.	-----	Rhagoletis pomonella (Walsh)
Boll weevil a.n.o.	-----	Anthonomus grandis Boh.
Bollworm a.n.o.	-----	Heliothis obsoleta (F.)
Booklouse a.n.o.	-----	Troctes divinatorius (Mull.)
Boxelder aphid a.n.o.	-----	Periphyllus negundinis (Thos.)
Boxelder bug a.n.o.	-----	Leptocoris trivittatus (Say)
Boxwood leaf miner a.n.o.	-----	Monarthropalpus buxi Laboulb.
Boxwood psyllid a.n.o.	-----	Psyllia buxi (L.)
Bronzed birch borer a.n.o.	-----	Agrilus anxius Gory
Brown-banded cockroach	-----	Supella supellectilum Serv.
Brown dog tick a.n.o.	-----	Rhipicephalus sanguineus (Latr.)
Brown-tail moth a.n.o.	-----	Nygma phaeorrhoea (Donov.)
Buckthorn aphid	-----	Aphis abbreviata Patch
Buffalo treehopper a.n.o.	-----	Ceresa bubalus (F.)
Bulb mite a.n.o.	-----	Rhizoglyphus hyacinthi Bdv.
Cabbage aphid a.n.o.	-----	Brevicoryne brassicae (L.)
Cabbage curculio a.n.o.	-----	Ceutorhynchus rapae Gyll.
Cabbage looper a.n.o.	-----	Autographa brassicae (Riley)
Cabbage maggot a.n.o.	-----	Hylemyia brassicae (Bouche)
Cabbage webworm a.n.o.	-----	Hellula undalis (F.)
California red scale a.n.o.	-----	Chrysomphalus aurantii (Mask.)
Camellia scale	-----	Lepidosaphes camelliae Hoke
Carpenter worm a.n.o.	-----	Prionoxystus robiniae (Peck)
Carpet beetle a.n.o.	-----	Anthrenus scrophulariae (L.)
Carrot beetle a.n.o.	-----	Ligyrus gibbosus (Deg.)
Carrot rust fly a.n.o.	-----	Psila rosae (F.)

Catalpa midge a.n.o.	Itonida catalpae Comst.
Catalpa sphinx a.n.o.	Ceratonia catalpae (Bdv.)
Cattle biting-louse a.n.o.	Bovicola bovis (L.)
Celery leaf tier	Phlyctaenia rubigalis Guen.
Chain-spotted geometer a.n.o.	Cingilia catenaria (Drury)
Changa a.n.o.	Scapteriscus vicinus Scudd.
Checker spot	Euphydryas chalcedona (Dblay. & Hew.)
Cherry scale a.n.o.	Aspidiotus forbesi Johns.
Chigger a.n.o.	Trombicula irritans (Riley)
Chinch bug a.n.o.	Blissus leucopterus (Say)
Chinese mantis a.n.o.	Tenodera sinensis Sauss.
Chrysanthemum aphid a.n.o.	Macrosiphoniella sanborni (Gill.)
Chrysanthemum gall midge a.n.o.	Diarthronomyia hypogaea Loew.
Chrysanthemum leaf miner a.n.o.	Phytomyza chrysanthemi (Kowarz)
Cigarette beetle a.n.o.	Lasioderma serricorne (F.)
Citrus mealybug a.n.o.	Pseudococcus citri (Risso)
Citrus red mite a.n.o.	Paratetranychus citri McG.
Citrus rust mite a.n.o.	Phyllocoptes oleivorus Ashm.
Citrus thrips a.n.o.	Scirtothrips citri (Moult.)
Citrus whitefly a.n.o.	Dialeurodes citri Ashm.
Clear-winged grasshopper a.n.o.	Camnula pellucida (Scudd.)
Cloudy-winged whitefly a.n.o.	Dialeurodes citrifolii (Morg.)
Clover leaf weevil a.n.o.	Hypera punctata (F.)
Clover mite a.n.o.	Bryobia praetiosa Koch
Clover stem borer a.n.o.	Languria mozardi Latr.
Codling moth a.n.o.	Carpocapsa pomonella L.
Colorado potato beetle a.n.o.	Leptinotarsa decemlineata (Say)
Common red spider a.n.o.	Tetranychus telarius (L.)
Comstock's mealybug	Pseudococcus comstocki Kuw.
Conchuela	Chlorochroa ligata (Say)
Confused flour beetle a.n.o.	Tribolium confusum Duv.
Corn ear worm a.n.o.	Heliothis obsoleta (F.)
Corn flea beetle a.n.o.	Chaetocnema pulicaria Melsh.
Corn lantern fly	Peregrinus maidis (Ashm.)
Corn root aphid a.n.o.	Anuraphis maidi-radicis (Forbes)
Corn root webworm a.n.o.	Crambus calignosellus Clem.
Corn rootworm a.n.o.	Diabrotica longicornis (Say)
Cotton aphid a.n.o.	Aphis gossypii Glov.
Cotton flea hopper a.n.o.	Psallus seriatus (Reut.)
Cotton leaf miner	Nepticula gossypii Forbes & Leonard
Cotton leaf perforator a.n.o.	Bucculatrix thurberiella Busck
Cotton leaf worm a.n.o.	Alabama argillacea (Hbn.)
Cotton stainer a.n.o.	Dysdercus suturellus (H.S.)
Cottonwood borer	Plectrodera scalator (F.)
Cottony-cushion scale a.n.o.	Icerya purchasi Mask.
Cottony maple scale a.n.o.	Pulvinaria vitis (L.)
Cowpea aphid a.n.o.	Aphis medicaginis Koch
Cowpea curculio a.n.o.	Chalcodermus aeneus Boh.
Cross-striped cabbage worm a.n.o.	Evergestis rimosalis (Guen.)
Currant aphid a.n.o.	Capitophorus ribis (L.)

Cyclamen mite a.n.o.	Tarsonemus pallidus Banks
Dart mealworm a.n.o.	Tenebrio obscurus F.
Deodar weevil a.n.o.	Pissodes nemorensis Germ.
Diamondback moth a.n.o.	Plutella maculipennis (Curt.)
Dictyospermum scale a.n.o.	Chrysomphalus dictyospermi (Morg.)
Douglas fir beetle a.n.o.	Dendroctonus pseudotsugae Hopk.
Douglas fir tussock moth a.n.o.	Hemerocampa pseudotsugata McD.
Ear tick a.n.o.	Ornithodoros megnini Duges
Eastern pine bark beetle	Ips pini (Say)
Eastern spruce beetle a.n.o.	Dendroctonus piceaperda Hopk.
Eastern tent caterpillar a.n.o.	Malacosoma americana (F.)
Eggplant lacebug a.n.o.	Gargaphia solani Heid.
Eight-spotted forester a.n.o.	Alypia octonaculata (F.)
Elm borer a.n.o.	Saperda tridentata Oliv.
Elm lacebug	Corythucha pallida ulmi O. & D.
Elm leaf beetle a.n.o.	Galerucella xanthomelaena (Schr.)
Elm leaf miner a.n.o.	Kaliosysphinga ulmi (Sund.)
Engelmann spruce beetle a.n.o.	Dendroctonus engelmanni Hopk.
Euonymus scale a.n.o.	Chionaspis euonymi Comst.
European corn borer a.n.o.	Pyrausta nubilalis (Hbn.)
European earwig a.n.o.	Forficula auricularia L.
European elm scale a.n.o.	Gossyparia spuria (Mod.)
European fruit lecanium a.n.o.	Lecanium corni Bouche
European pine shoot moth a.n.o.	Rhyacionia buoliana (Schiff.)
European red mite a.n.o.	Paratetranychus pilosus (C. and F.)
European spruce sawfly a.n.o.	Diprion polytonum (Htg.)
European wheat stem sawfly a.n.o.	Cephus pygmaeus (L.)
European willow leaf beetle	Flagiolodera versicolora (Laich.)
Eye-spotted budmoth a.n.o.	Spilonota ocellana (D. & S.)
Fall armyworm a.n.o.	Laphygna frugiperda (S. & A.)
Fall cankerworm a.n.o.	Alsophila pometaria (Harr.)
Fall webworm a.n.o.	Hyphantria cunea (Drury)
False chinchbug a.n.o.	Nysius ericae (Schill.)
Field cricket a.n.o.	Gryllus assimilis F.
Fig moth	Ephestia cautella Walk.
Fir bark louse	Dreyfusia piceae Ratz.
Flatheaded apple tree borer a.n.o.	Chrysobothris femorata (Oliv.)
Florida red scale a.n.o.	Chrysomphalus aonidium (L.)
Flower thrips a.n.o.	Frankliniella tritici (Fitch)
Forest tent caterpillar a.n.o.	Malacosoma disstria Hbn.
Fruit tree leaf roller a.n.o.	Cacoecia argyrospila (Walk.)
Fuller's rose beetle a.n.o.	Pantomerus godmani (Crotch)
Garden centipede a.n.o.	Scutigera immaculata (Newp.)
Garden flea hopper a.n.o.	Halticus citri (Ashm.)
Garden webworm a.n.o.	Loxostege similalis (Guen.)
Giant hornet a.n.o.	Vespa crabro L.
Gladiolus thrips a.n.o.	Taeniothrips simplex Morison
Golden oak scale	Asterolecanium variolosum Ratz.
Grape berry moth a.n.o.	Polychrosis viteana (Clen.)
Grape colaspis a.n.o.	Colaspis brunnea (F.)
Grape leaf folder a.n.o.	Desmia funeralis (Hbn.)
Grape leafhopper a.n.o.	Erythroneura comae (Say)

Grape mealybug a.n.o.-----Pseudococcus maritimus (Ehrh.)
 Grape phylloxera a.n.o.-----Phylloxera vitifoliae Fitch
 Grape sawfly a.n.o.-----Erythrastides pygmaea (Say)
 Grape thrips-----Drepanothrips reuteri Uzel
 Grape tomato gall-----Lasioptera vitis O.S.
 Green bug a.n.o.-----Toxoptera graminum Rond.
 Green citrus aphid-----Aphis spiraeicola Patch
 Green clover worm a.n.o.-----Plathypena scabra (F.)
 Greenhouse leaf tier a.n.o.-----Phlyctaenia rubigalis (Guen.)
 Green June beetle a.n.o.-----Cotinis nitida (L.)
 Green peach aphid a.n.o.-----Myzus persicae (Sulz.)
 Greenhouse stone cricket a.n.o.-----Tachycines asynamorus Adel.
 Greenhouse whitefly a.n.o.-----Trialeurodes vaporariorum (Westw.)
 Green stinkbug a.n.o.-----Acrosternum hilaris (Say)
 Green-striped maple worm a.n.o.-----Anisota rubicunda F.
 Gulf coast tick a.n.o.-----Amblyomma maculatum Koch.
 Gulf wireworm a.n.o.-----Heteroderes laurentii (Guer.)
 Gypsy moth a.n.o.-----Porthetria dispar (L.)

Hairy chinch bug a.n.o.-----Blissus hirtus Montd.
 Harlequin bug a.n.o.-----Murgantia histrionica (Hahn)
 Hawaiian beet webworm a.n.o.-----Hymenia fascialis (Cram.)
 Hemlock looper a.n.o.-----Ellopiia fiscellaria Guen.
 Hemlock scale-----Aspidiotus abietis Schr.
 Hessian fly a.n.o.-----Phytophaga destructor (Say)
 Hickory phylloxera -----Phylloxera caryaecaulis Fitch
 Hickory shuck worm a.n.o.-----Laspeyresia caryana (Fitch)
 hog louse a.n.o.-----Haematopinus suis (L.)
 Holly leaf miner a.n.o.-----Phytomyza ilicicola Loew.
 Hop aphid a.n.o.-----Phorodon humuli (Schr.)
 Hop flea beetle a.n.o.-----Psylliodes punctulata Melsh.
 Horn fly a.n.o.-----Haematobia irritans L.
 House centipede a.n.o.-----Scutigera forceps Raf.
 House cricket a.n.o.-----Gryllus domesticus L.

Imbricated snout beetle a.n.o.-----Epicaerus imbricatus (Say)
 Imperial moth a.n.o.-----Eacles imperialis (Drury)
 Imported cabbage worm a.n.o.-----Pieris rapae L.
 Imported currant worm a.n.o.-----Pteroniidea ribesii (Scop.)
 Indian-meal moth a.n.o.-----Plodia interpunctella (Hbn.)
 Introduced pine sawfly a.n.o.-----Diprion simile (Htg.)
 Iris borer a.n.o.-----Macronoctua onusta Grote

Japanese beetle a.n.o.-----Popillia japonica Newm.
 Japanese maple scale-----Leucaspis japonica Okl.
 Juniper scale-----Diaspis carueli Targ.
 Juniper webworm-----Dichomeris marginellus F.

Larch casebearer a.n.o.-----Coleophora laricella Hbn.
 Larch sawfly a.n.o.-----Lygaeonematus erichsonii (Htg.)
 Larger canna leaf roller a.n.o.-----Calpodēs ethlius (Cram.)

Leaf crumpler a.n.o.	Mineola indigenella (Zell.)
Leaf-footed bug a.n.o.	Leptoglossus phyllopus (L.)
Leconte's sawfly	Neodiprion lecontei Fitch
Lesser cornstalk borer a.n.o.	Elasmopalpus lignosellus (Zell.)
Lesser grain borer	Rhizopertha dominica (F.)
Lesser migratory grasshopper	Melanoplus mexicanus Sauss.
Lesser peach borer a.n.o.	Conopia pictipes (G. & R.)
Lilac borer a.n.o.	Podosesia syringae (Harr.)
Lilac leaf miner a.n.o.	Gracilaria syringella F.
Lima bean pod borer a.n.o.	Etiella zinckenella (Treit.)
Linden borer a.n.o.	Saperda vestita Say
Locust borer a.n.o.	Cyllene robiniae (Forst.)
Locust leaf miner a.n.o.	Chalepus dorsalis Thunb.
Lodgepole needleminer a.n.o.	Recurvaria milleri Busck
Magnolia scale a.n.o.	Neolecanium cornuparvum (Thro)
Mango shield scale	Coccus mangiferæ Green
Maple bladder gall	Phyllocoptes quadripes Shim.
Maple borer	Conopia acerni Clem.
Maritime earwig	Anisolabis maritima Bonelli
Mealy flata	Ormenis pruinosa (Say)
Mealy plum aphid a.n.o.	Hyalopterus arundinis (F.)
Melon aphid a.n.o.	Aphis gossypii Glov.
Mexican bean beetle a.n.o.	Epilachna varivestis Muls.
Monarch butterfly a.n.o.	Danaus menippe (Hbn.)
Mormon cricket a.n.o.	Anabrus simplex Hald.
Mossy rose gall a.n.o.	Rhodites rosae (L.)
Mountain ash sawfly	Pristiphora geniculata Htg.
Mountain pine beetle a.n.o.	Dendroctonus monticolæ Hopk.
Mourning-cloak butterfly a.n.o.	Hamadryas antiopa (L.)
Nantucket pine shoot moth	Rhyacionia frustrana Comst.
Native elm bark beetle a.n.o.	Hylurgopinus rufipes (Eich.)
Nautical borer	Xylotrechus nauticus (Mann.)
Naval orange worm a.n.o.	Myelois venipars Dyar
Nevada buck moth	Hemileuca nevadensis Stretch
Modular twig gall	Rhodites nodulosus Beut.
Northern mole cricket a.n.o.	Gryllotalpa hexadactyla Perty
No-see-ums	Leptoconops sp.
Oak lacebug	Corythucha arcuata (Say)
Oak scale	Lecanium quercifex Fitch
Oblong leaf weevil	Phyllobius oblongus L.
Obscure scale a.n.o.	Chrysomphalus obscurus (Comst.)
Olender caterpillar	Syntomeida epialis Walk.
Olender scale a.n.o.	Aspidiotus hederæ (Vallot)
Onion maggot a.n.o.	Hylemyia antiqua Meig.
Onion thrips a.n.o.	Thrips tabaci Lind.
Orange-striped oak worm a.n.o.	Anisota senatoria (S. & A.)
Ornoid weevil	Diorymerellus laevimargo Champ.
Oriental beetle a.n.o.	Anomala orientalis Wtrh.
Oriental fruit moth a.n.o.	Grapholitha molesta (Busck)
Oriental moth a.n.o.	Cnidocampa flavescens (Walk.)
Oystershell scale a.n.o.	Lepidosaphes ulmi (L.)

Pacific flatheaded borer a.n.o.	Chrysobothris mali Horn
Pacific mite	Tetranychus pacificus McG.
Painted hickory borer	Cyllene caryae Gahan
Painted lady a.n.o.	Cynthia cardui (L.)
Pale-striped flea beetle a.n.o.	Systema blanda Melsh.
Pale western cutworm a.n.o.	Porosagrotis orthogonia (Morr.)
Pales weevil a.n.o.	Mylobius pales (Hbst.)
Pandora moth a.n.o.	Coloradia pandora Blake
Parsnip webworm a.n.o.	Depressaris heracliana (Deg.)
Pea aphid a.n.o.	Illinoia pisi (Kltb.)
Pea moth a.n.o.	Laspeyresia nigricana (Steph.)
Pea weevil a.n.o.	Bruchus pisorum (L.)
Peach borer a.n.o.	Conopia exitiosa (Say)
Peach twig borer a.n.o.	Anarsia lineatella Zell.
Pear borer	Conopia pyri Harr.
Pear leaf blister mite a.n.o.	Eriophyes pyri Pgst.
Pear leaf-curling midge	Dasyneura pyri Bouche
Pear psylla a.n.o.	Psylla pyricola (Foerst.)
Pear slug a.n.o.	Eriocampoides limacina (Retz.)
Pear thrips a.n.o.	Taeniothrips inconsequens (Uzel)
Pecan cigar casebearer a.n.o.	Coleophora caryaefoliella Clem.
Pecan leaf casebearer a.n.o.	Acrobasis juglandis (LeB.)
Pecan nut casebearer a.n.o.	Acrobasis caryae Grote
Pecan weevil a.n.o.	Curculio caryae (Horn)
Pepper weevil a.n.o.	Anthonomus eugenii Cano
Periodical cicada a.n.o.	Magicicada septendecim (L.)
Pharaoh's ant a.n.o.	Monomorium pharaonis (L.)
Phlox plant bug	Lopidea davisi Knight
Pickleworm a.n.o.	Diaphania nitidalis (Stoll)
Pine bark aphid a.n.o.	Pineus strobi Htg.
Pine leaf miner	Paralechia pinifoliella Chamb.
Pine needle scale a.n.o.	Chionaspis pinifoliae (Fitch)
Pink bollworm a.n.o.	Pectinophora gossypiella (Saund.)
Pipevine caterpillar	Papilio philenor L.
Pistol casebearer a.n.o.	Coleophora malivorella Riley
Pitch-mass borer	Parharmonia pini Kellicott
Plains false wireworm a.n.o.	Elcodes opaca (Say)
Plum curculio a.n.o.	Conotrachelus nenuphar (Hbst.)
Poplar and willow borer a.n.o.	Cryptorhynchus lapathi (L.)
Poplar tentmaker	Ichthura inclusa Hbn.
Poplar vagabond aphid a.n.o.	Mordwilkoja vagabunda (Walsh)
Potato aphid a.n.o.	Illinoia solanifolii (Ashm.)
Potato flea beetle a.n.o.	Epitrix cucumeris Harr.
Potato leafhopper a.n.o.	Empoasca fabae (Harr.)
Potato psyllid	Paratrioza cockerelli (Sulc.)
Potato stalk borer a.n.o.	Trichobaris trinotata (Say)
Potato tuber worm a.n.o.	Gnorimoschema operculella (Zell.)
Purple scale a.n.o.	Lepidosaphes beckii (Newm.)
Puss caterpillar a.n.o.	Megalopyge opercularis (S. & A.)

Rabbit tick a.n.o.	Haemaphysalis leporis-palustris Pack.
Raisin moth a.n.o.	Ephestia figulilella Greg.
Rapid plant bug a.n.o.	Adelphocoris rapidus (Say)
Raspberry cane borer a.n.o.	Oberea bimaculata (Oliv.)
Raspberry fruitworm a.n.o.	Byturus unicolor Say
Raspberry root borer a.n.o.	Bembecia marginata (Harr.)
Red-banded leaf roller a.n.o.	Argyrotaenia velutiana (Walk.)
Red harvester ant a.n.o.	Pogonomyrmex barbatus (F. Smith)
Red-headed pine sawfly a.n.o.	Neodiprion lecontei (Fitch)
Red-humped caterpillar a.n.o.	Schizura concinna (S. & A.)
Red-necked cane borer a.n.o.	Agrilus ruficollis (F.)
Rhododendron borer	Sesia rhododendri Boutn.
Rhododendron lacebug a.n.o.	Stephanitis rhododendri Horv.
Rice weevil a.n.o.	Sitophilus oryza (L.)
Ring-legged ear wig a.n.o.	Anisolabis annulipes (Lucas)
Rose aphid a.n.o.	Macrosiphum rosae (L.)
Rose chafer a.n.o.	Macroductylus subspinosus (F.)
Rose curculio a.n.o.	Rhynchites bicolor (F.)
Rose leaf beetle a.n.o.	Nodonota puncticollis Say
Rose midge a.n.o.	Dasyneura rodophaga (Coq.)
Rose scale a.n.o.	Aulacaspis rosae (Bouché)
Rosy apple aphid a.n.o.	Anuraphis rosae (Baker)
Roundheaded apple tree borer a.n.o.	Saperda candida F.
Rusty plum aphid a.n.o.	Hysteroneura setariae (Thos.)
Saddleback caterpillar a.n.o.	Sibine stimulea (Clen.)
Salt-marsh caterpillar a.n.o.	Estignene acraea (Drury)
San Jose scale a.n.o.	Aspidiotus perniciosus Const.
Satin moth a.n.o.	Stilpnotia salicis (L.)
Say's stinkbug a.n.o.	Chlorochroa sayi Stal
Screwworm a.n.o.	Cochliomyia americana C. & P.
Scurfy scale a.n.o.	Chionaspis furfura (Fitch)
Seed-corn maggot a.n.o.	Hylemyia cilicrura Rond.
Sequoia pitch moth a.n.o.	Vesperina sequoiae (Hy. Edw.)
Sheep botfly a.n.o.	Oestrus ovis L.
Shot-hole borer a.n.o.	Scolytus rugulosus Ratz.
Six-spotted mite a.n.o.	Tetranychus sexmaculatus Riley
Smaller European elm bark beetle a.n.o.	Scolytus multistriatus Marsh.
Smartweed borer a.n.o.	Pyrausta ninsulci Heinr.
Saw scale	Chionaspis citri Const.
Snowball aphid a.n.o.	Aphis viburnicola Gill.
Snowy tree cricket a.n.o.	Occanthus niveus (Deg.)
Soft scale a.n.o.	Coccus hesperidum L.
Sorghum webworm a.n.o.	Colpa sorghicola (Riley)
Southern armyworm a.n.o.	Prodenia eridania (Cram.)
Southern cabbage worm a.n.o.	Ascia proteodice (Bdv. & Lec.)
Southern corn rootworm a.n.o.	Diabrotica duodecimpunctata (F.)
Southern cornstalk borer a.n.o.	Diatraea crumbidoides (Grote)
Southern green stinkbug a.n.o.	Nezara viridula (L.)
Southern male cricket a.n.o.	Scapteriscus velatus R. & H.
Southern pine beetle a.n.o.	Dendroctonus frontalis Zinn.

Southern pine sawyer a.n.o.	-----	<i>Monochamus titillator</i> (F.)
Spotted cucumber beetle a.n.o.	-----	<i>Diabrotica duodecimpunctata</i> (F.)
Spring cankerworm a.n.o.	-----	<i>Paleacrita vernata</i> (Peck)
Spruce budworm a.n.o.	-----	<i>Cacoecia fumiferana</i> (Clem.)
Spruce gall aphid	-----	<i>Chermes abietis</i> L.
Spruce mite	-----	<i>Paratetranychus uniunguis</i> Jacobi
Spruce needle miner	-----	<i>Taniva albolineana</i> Kearf.
Squash borer a.n.o.	-----	<i>Melittia satyriniformis</i> Hbn.
Squash bug a.n.o.	-----	<i>Anasa tristis</i> (Deg.)
Stablefly a.n.o.	-----	<i>Stomoxys calcitrans</i> (L.)
Stalk borer a.n.o.	-----	<i>Papaipema nebris nitela</i> (Guen.)
Sticktight flea a.n.o.	-----	<i>Echidnophaga gallinacea</i> (Westw.)
Strawberry crown miner	-----	<i>Aristotelia fragariae</i> Busck
Strawberry leaf roller a.n.o.	-----	<i>Ancylis comptana</i> (Froel.)
Strawberry root aphid a.n.o.	-----	<i>Aphis forbesi</i> Weed
Strawberry root weevil a.n.o.	-----	<i>Brachyrhinus ovatus</i> (L.)
Strawberry weevil a.n.o.	-----	<i>Anthonomus signatus</i> Say
Striped cucumber beetle a.n.o.	-----	<i>Diabrotica vittata</i> (F.)
Striped flea beetle a.n.o.	-----	<i>Phyllotreta vittata</i> (F.)
Suckfly a.n.o.	-----	<i>Dicyphus minimus</i> Uhl.
Sucking dog louse	-----	<i>Linognathus piliferus</i> Burm.
Sugar-beet wireworm a.n.o.	-----	<i>Limonius californicus</i> (Mann.)
Sugarcane beetle a.n.o.	-----	<i>Euetheola rugiceps</i> (Lec.)
Sugarcane borer a.n.o.	-----	<i>Diatraea saccharalis</i> (F.)
Sugar maple borer a.n.o.	-----	<i>Glycobius speciosus</i> (Say)
Sunflower weevil	-----	<i>Rhodoaenus tredecimpunctata</i> (Ill.)
Sweetpotato hornworm a.n.o.	-----	<i>Herse cingulata</i> (F.)
Sweetpotato leaf beetle	-----	<i>Typophorus viridicyaneus</i> Cr.
Sweetpotato weevil a.n.o.	-----	<i>Cylas formicarius</i> (F.)
Tarnished plant bug a.n.o.	-----	<i>Lygus pratensis</i> (L.)
Terrapin scale a.n.o.	-----	<i>Lecanium nigrofasciatum</i> Perg.
Thief ant a.n.o.	-----	<i>Solenopsis molesta</i> (Say)
Three-cornered alfalfa hopper a.n.o.	-----	<i>Stictocephala festina</i> (Say)
Thurberia weevil a.n.o.	-----	<i>Anthonomus grandis thurberiae</i> Pierce
Tissue paper bug	-----	<i>Thylognathus contractus</i> Mots.
Tobacco budworm a.n.o.	-----	<i>Heliothis virescens</i> (F.)
Tobacco flea beetle a.n.o.	-----	<i>Epitrix parvula</i> (F.)
Tobacco moth a.n.o.	-----	<i>Ephestia elutella</i> (Hbn.)
Tobacco stalk borer	-----	<i>Trichobaris mucorea</i> (Lec.)
Tobacco thrips a.n.o.	-----	<i>Frankliniella fusca</i> (Hinds)
Tobacco wireworm	-----	<i>Monocrepidius vespertinus</i> (F.)
Tobacco worm a.n.o.	-----	<i>Protoparce quinquemaculata</i> (Haw.)
Tomato pinworm a.n.o.	-----	<i>Gnorimoschema lycopersicella</i> (Busck)
Tomato worm a.n.o.	-----	<i>Protoparce sexta</i> (Johan.)
Tropical rat mite a.n.o.	-----	<i>Liponyssus bacoti</i> (Hirst)
Turnip aphid a.n.o.	-----	<i>Rhopalosiphum pseudobrassicæ</i> Davis
Twig girdler a.n.o.	-----	<i>Oncideres cingulatus</i> (Say)
Twig pruner a.n.o.	-----	<i>Hypermallus villosus</i> (F.)
Two-marked treehopper	-----	<i>Enchenopa binotata</i> (Say)

Ugly-nest caterpillar a.n.o.-----	Cacoecia cerasivorana (Fitch)
Variegated cutworm a.n.o.-----	Lycophotia margaritosa saucia Hbn.
Vegetable weevil a.n.o.-----	Listroderes obliquus Klug
Velvetbean caterpillar a.n.o.-----	Anticarsia gemmatilis (Hbn.)
Vetch bruchid a.n.o.-----	Bruchus brachialis Fahraeus
Walnut caterpillar a.n.o.-----	Datana integerrima G. & R.
Western chinch bug a.n.o.-----	Blissus occiduus Barber
Western pine beetle a.n.o.-----	Dendroctonus brevicornis Lec.
Western spotted cucumber beetle a.n.o.---	Diabrotica soror Lec.
Western tent caterpillar a.n.o.-----	Malacosoma pluvialis (Dyar)
Wheat stem maggot a.n.o.-----	Meromyza americana Fitch
Wheat stem sawfly a.n.o.-----	Cephus cinctus Nort.
White apple leafhopper a.n.o.-----	Typhlocyba pomaria McAtee
White fir looper-----	Ellopiopsis fuscicollis lugubrosa Hlnt.
White fir tussock moth -----	Hemerocampa oslari Barnes
White-fringed beetle-----	Naupactus leucoloma Boh.
White-lined sphinx a.n.o.-----	Sphinx lineata F.
White-marked tussock moth a.n.o.-----	Hemerocampa leucostigma (S. & A.)
White peach scale a.n.o.-----	Aulacaspis pentagona (Targ.)
White-pine weevil a.n.o.-----	Pissodes strobi (Peck)
Winter tick a.n.o.-----	Dermacentor albipictus (Pack.)
Woolly alder aphid a.n.o.-----	Prociphilus tessellatus (Fitch)
Woolly apple aphid a.n.o.-----	Eriosoma lanigerum (Hausm.)
Woolly elm aphid a.n.o.-----	Eriosoma americanum Riley
Yellow-headed spruce sawfly a.n.o.-----	Pachynematus ocreatus Hgtn.
Yellow-necked caterpillar a.n.o.-----	Datana ministra (Drury)
Zebra caterpillar a.n.o.-----	Mamestra picta Harr.



